COAL AGE

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Good Fellows

Written expressly for Coal Age by
BERTON BRALEY

THE barkeeps seem a pleasant lot, they greets yuh with a smile,
They sets the drinks before yuh in a most allurin' style,
And while yer money's plenty they will treat yuh like a king,
But when ye're flat an' busted—why, that's quite a diff'runt thing!

It's "Thank you, sir" an' "How de do?" an' "Won't yuh have a drink?"
An' "Here's to Mr. Miner" when yu've got a lot of chink,
It's "Welcome to our city!" when you've got a tidy sum,
But when the roll is squandered, it is, "T'row him out, th' bum!"

IT'S jolly when yu've finished with yer labor underground
To linger in the barroom where th' bunch is hangin' round,
Where the barkeep hollers, "Howdy" when yuh toss across a bill,
But it's quite another story when yer roll is in the till!

It's "Thank you sir!" an' "How's the boy?" an' "Mister" this an' that,
An' "Welcome to our city!" when th' roll is good an' fat,

It's "Welcome to our city!" when yu've got th' cash to pay,
But it's "Take yer shoes an' beat it!" when you've blowed the cash away!

SO you kin run with barkeeps just as often as yuh please,
But I will keep my distance from such tricky "friends" as these,
They're cordial an' they're merry when there's money in yer poke,
But they go an' call th' bouncer when ye're down an' out an' broke!

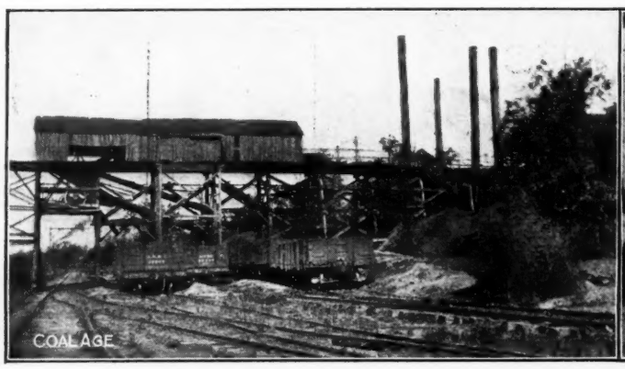
It's "Mister" this, an' "Mister" that, an' "Here's to YOU, Old Scout!"
But it's "Git, yuh dirty hobo!" when ye're broke an' down an' out;
It's "Welcome to our city!" when ye're quite amonied gent,
But it's "Bounce th' lazy loafer!" when yer little roll is spent!

A Sudden Squeeze in an Oklahoma Mine

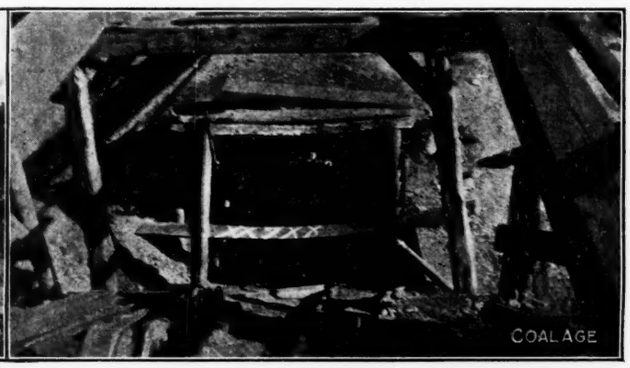
By Geo. M. Brown*

SYNOPSIS—A squeeze suddenly entirely closed an Oklahoma mine which was about to be abandoned, burying 13 men beyond all hope of recovery. An attempt to reach the workings through a neighboring mine completely failed and the bodies of the men will probably never be recovered.

On Friday afternoon, Sept. 4, 1914, an unusual, unforeseen and fatal squeeze took place in Mine No. 1 of the Union Coal Co., at Adamson, Okla., resulting in the death of 13 coal miners and the complete loss of the mine and underground equipment The men are probably buried under 700 ft. of earth and all hope of their rescue has been abandoned.



Mine No. 1 of Union Coal Co. at Adamson, Okla.



Mouth of Mine, Showing Dead-Line Marks

The mine had been driven down ten lifts and as the remaining coal could be gotten from Mines 4 and 2 on the west and east, respectively, it was to have been abandoned this fall. It was worked on the room-and-pillar double-entry system, chute rooms being driven up the pitch, the dip being about thirty degrees. The slope was driven down the dip and the entries on the strike.

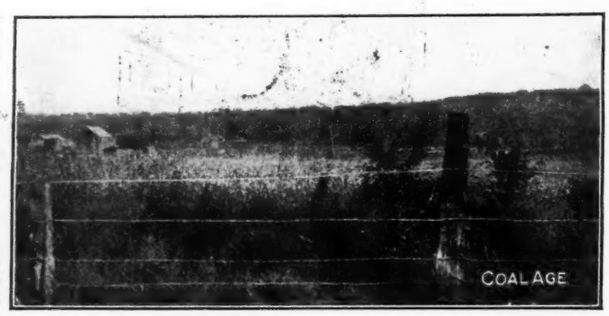
Owing to lack of coal the miners usually cleaned up early and went home. On that account, man-trips were run at noon, at two o'clock and at any time after three o'clock for individual miners. On this day, however, the men worked later than usual and the first man-trip was pulled at 3:53 p.m. These men noticed nothing unusual. The second trip went down to the eighth lift, the first having been to the upper lifts. The men started the mules ahead of the trip as is usually done in Oklahoma and the trip started slowly up the slope. These men noticed the caving down at the slope face but evidently thought of nothing serious. That trip got up at 4:20 p.m. The rope rider refused to go back with the trip, sending it back, however, unaccompanied. It stopped at the sixth lift, and, as the engineer could not move it, the caves had evidently reached that point.

Two Men Race with the Squeeze Successfully

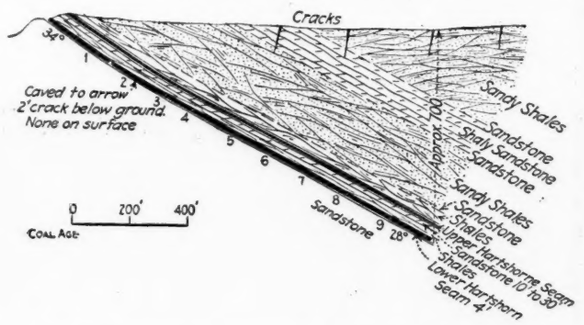
The escape of two of the men was indeed thrilling. The shot firer had gone down and was at No. 3 room on the eighth east entry. He heard the squeezing and ran for the slope, being joined there by a miner. This miner had been at the ninth lift and hearing the caving shouted to the men below to come on out. One man called "Candy Kid" shouted back, "You've got rabbit in you. We're going to wait for the trip. We won't climb out." The trip never came. The shot firer and miner climbed out and as they looked back could see the lights down below but the men had waited too long. At times the caves almost caught the two exhausted men but they finally won out.

Superintendent Mackinnon arrived at 4:30 p.m. and the exits out of the mine being blocked he set men to cut-

*Mining engineer, Osage Coal & Mining Co., McAlester, Okla.



The Lay of the Land North from No. 1 Mine



Cross-Section through Seam at No. 1 Mine

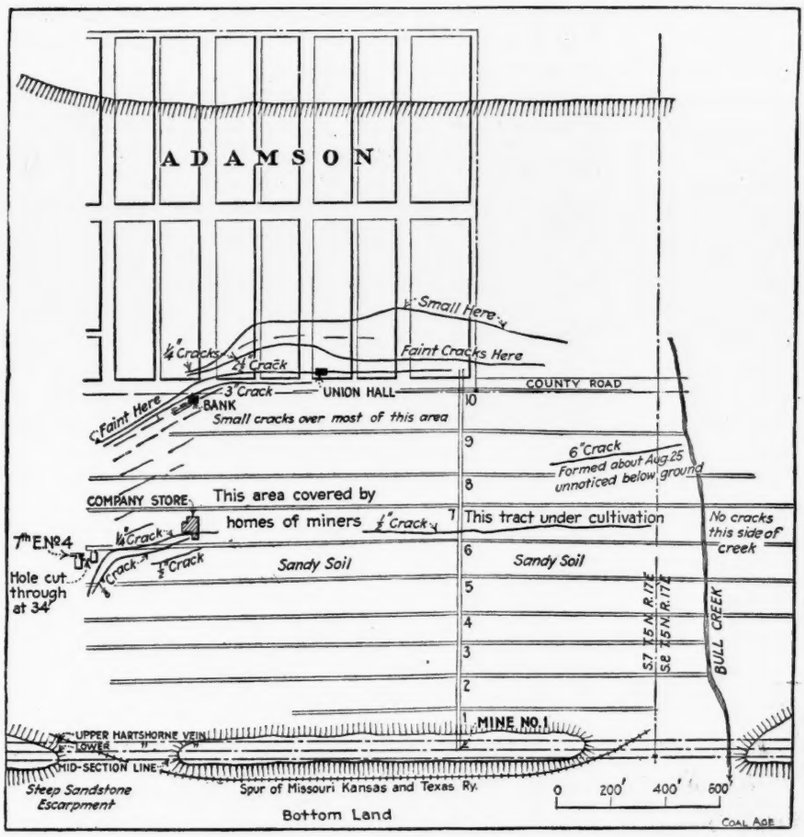
ting a hole through a pillar between mines Nos. 1 and 4. The maps showed 34 ft. of coal and were correct to the foot. The hole was cut through the next afternoon (Saturday). The last cutting brought through so much gas that helmets had to be used. These were brought from McAlester by a rescue party composed of J. J. Rutledge, J. R. Fleming, J. W. Koster and W. T. Burgess, all of the Bureau of Mines. The miners were willing volunteers and everything possible was done. W. E. Beaty, president of the company, was on hand and no expense was spared in pushing the work. The hole was finally widened out and entrance effected on Saturday night.

Rescue Unavailing and Is Abandoned

The rescue party got inside No. 1 mine only 25 ft. and were stopped by a solid wall of slate. The finding of large surface cracks led to the belief that rescue was hopeless and after further investigations by the chief mine inspector, Ed. Boyle, and District Inspector, Martin Clark, it was decided to abandon all hope as the gases released from an upper seam were such as to quickly suffocate the imprisoned men. It is the general belief that the men never got off the slope. The sudden squeezing of the strata would jam the mine doors on the partings so that it would be impossible to open them and the men would be trapped. Evidently there would be no retreating to the face of the slope as the first caves were reported there. The fans and air compressors were run continuously but as the air pipes in No. 1 were hung on timbers they were probably broken by the falling slate.

The condition of the mine was probably as good as the average mine in Oklahoma. The slope was safely timbered from top to bottom. The rooms were turned on 33-ft. centers with a room pillar of from 9 to 12 ft. The top is of sandy shale, 18 to 28 ft. thick, and is considered good. Above this is a stratum of hard sandstone and a little fireclay. Then comes the upper Hartshorne bed 47 ft. above the lower seam, the latter being worked by No. 1. Above the upper seam we find alternate layers of sandstone, sandy and ordinary dark shales.

The surface conditions are as follows: The Hartshorne seams as a rule outcrop along the top of a hill. At Adamson these outcrops lie east and west. The sandstone stratum below the lower Hartshorne bed at the Adamson mines forms a steep escarpment south of which lies low bottom land overflowed by Gaines Creek. North of the crop line the soil is sandy and lies probably twenty feet lower than the outcrops. This area is all more or less covered by timber. About one-half mile north of the mines there is another range of hills about one hundred feet high, composed mostly of sandstone lying below the McAlester seam.



Plan of Mine and Town of Adamson, Showing How Surface Cracks Are Exhibited in Vicinity of Caving

A Large Crack in Front of Union Hall, Adamson, Okla.

The Suddenness of the Collapse

We are accustomed to squeezes in Oklahoma, but generally they act slowly and give plenty of warning. This one, however, was so sudden that it gave scarcely any intimation, and mining men here are puzzled to account for it. It is possible that a fault in the face of the slope extended to the surface and formed a plane of cleavage as it were in the strata. This would throw the whole weight of the overburden on the pillars since there would

be no tendency of the strata to overhang the solid coal. The heavy layer of sandstone would not bend and would naturally prove troublesome. The existence of such a fault on the surface would be hard to find on account of the deep surface soil and sand.

However the accident seems to have been caused by some unusual condition in the overlying strata which mining men here cannot account for. A discussion of similar accidents no doubt will throw light on this unusual occurrence.

From W. E. Beaty, the president and B. E. Clark, the engineer, I received the mine maps and other data which were freely given without hesitation to all who sought for information, and I desire here to express my indebtedness to them for this assistance, without which this article could not have been compiled.

Fighting a Gob Fire by Surface Drilling

By D. H. Somerville and Tracy Garrett*

SYNOPSIS—Peculiar rock formations rendered fighting a gob fire from the mine of little avail. A hole was accordingly drilled from the surface through which water, sand and adobe mud are being poured. All indications point to the success of this method of attack.

At the Weaver mine of the Victor-American Fuel Co., in McKinley County, New Mexico, an effort is being made to quench an old gob fire by means of surface drilling. After years of endeavor, underground, to seal off the affected area and put an end to fire trouble, with no decisive result, it was decided to try a new method, one conceived by W. J. Murray, vice-president and general manager of the company, as early as January, 1911, but which was not attempted until March of this year.

A drill hole was put down from the surface to the fire zone, 291 ft. below, and through this hole tons of water, adobe mud and sand are being dumped. The work is not yet completed but, thus far the results have all been favorable to the new method and the indications are that the outcome will be a complete victory over the old enemy of the mine.

That there may be a thorough understanding of the conditions existing, the difficulties encountered and the work done, a brief description of the fields and coal may be of interest.

General View of Dredging Machinery at Bore-Hole

The mines in this field are working two different series of lignitic, noncoking coals, known as the upper and lower measures. Both are in the Laramie Cretaceous beds. The two measures are separated by from 500 to 800 ft. There are in the upper group five distinct veins, known as Nos. 1, 2, 3, 3½ and 5, but at no one point in the field are all of these veins workable.

At the Weaver mine, when it was opened, three of these veins were workable, but on going back into the field, but two of them can be operated, namely Nos. 3 and 5. Toward the outcrop, however, Nos. 3 and 3½ were worked extensively. The distance between the Nos. 5 and 3½ runs about 26 ft., while that between Nos. 3½ and 3 runs only about 6 ft.

The strata between these two veins are so thin that it has always been difficult to work out both measures successfully. If the upper of the two, the No. 3, was worked first, the lower measure would heave the bottom and, if the lower of the two, the No. 3½ vein, was worked first, the upper would cave the roof so that, in some cases, it was apparently necessary to leave much coal in the gobs.

The coal thus left in the gobs fired spontaneously, and this was the condition when the Victor-American Fuel Co., the present operator of the mine, took over the property from the former owners several years ago.

To Seal the Fire Off Was Difficult

As there is very little cover over the coal near the outcroppings and consequently many surface breaks, through which air could travel to support combustion, there has been no end of trouble, at different times, in endeavoring to seal off the burning area.

The roof over the No. 5 vein, in fact, the whole strata between it and the No. 3½ vein, is a mixture of sandy shale and fireclay. This increased the difficulties under which those engaged in the work of sealing off the fire were forced to labor. In some cases breaks in the roof of the No. 5 vein would extend through to the No. 3½ and No. 3 veins, which are now old workings.

At one point in the workings of the No. 5 vein, the fire traveled through these crevices and reached down into the lower measure. This happened in a crosscut between a pair of entries. A considerable part of the roof had fallen in this crosscut, almost to the upper vein where the fire was, before it was noticed.

Concrete walls were then built alongside of these entries and these were connected by similar walls built through the chain pillar at both the upper and lower ends of the side walls. The main entry was then arched and thus the fire in the No. 5 vein was confined to a comparatively small area. Considerable difficulty was, however, experienced in doing this and in shutting off the air,

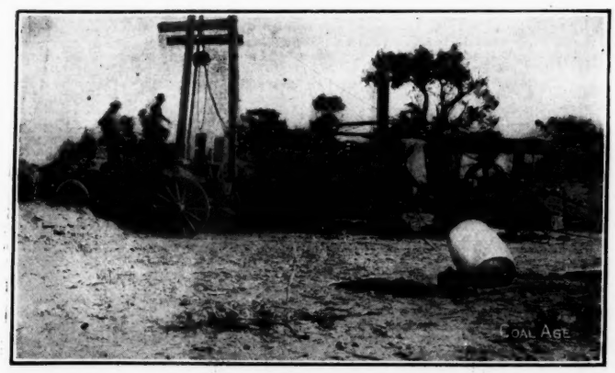
*Victor-American Fuel Co., Gibson, N. M.

as the concrete would crack with the heat, making continual work, watching and expense.

It was then decided to attack the fire by surface drilling and arrangements were immediately made to sink a hole to a point directly over the caved area in the fire zone.

The point on the surface thus selected for operations was not readily accessible for heavy drilling machinery and a light, churn well drill was selected for the work, the power being a gasoline engine, the only rigging being a gin pole instead of a derrick. The drill was equipped with a wire cable instead of the hemp rope usually used on apparatus of this character on account of the heat to be encountered.

Drilling began on Mar. 6, and a 6-in. hole was put down. At 250 ft. the heat became decidedly noticeable and gave warning that the fire was not far below the bit of the drill. From this point on, steam and gases arose and, though a 1-in. stream of water from a pipe line that



INTRODUCING A CHARGE OF ADOBE MUD INTO THE PIPE

had been laid from the camp tanks, was continuously discharged into the hole, the bit, when pulled, was invariably too hot to handle without gloves.

A telephone line, connecting with the mine telephone system, was strung to the drill and the men on the surface kept constantly in touch with those on the inside. There was much speculation as to just what would happen when the drill went through onto the fire and when the first water and mud were poured into the hole. For this reason, it was thought best, in the interest of safety to keep all men, except those actually engaged in the work in the troubled area, out of the mine until it was definitely determined that there was no danger of an explosion of steam or a sudden spreading of smoke or gases. This was done, although, as it fortunately turned out, the precaution was unecessary.

THE DRILL HOLE WAS CASED

The 6-in. hole was cased with a 4½-in. casing, which was extended down to the cave. Into this casing a smaller pipe was inserted with packing around same and a valve at the top. A barrel, to act as a funnel, was placed on top of this latter pipe, a short nipple connecting the barrel with the valve. A larger pipe line was laid from the water tanks and a mixing box placed in such a position as to empty into the barrel by means of a suitable trough.

To prevent the air from reaching the fire by way of the hole, the plan followed was to make a mixture of sand, adobe and water in the mixing box, run this into the barrel until the latter was filled, keeping the valve closed, then, opening the valve, allow about three-fourths of the contents of the barrel to run through the hole, the mixture remaining in the barrel, shutting off the air until the valve could be closed again.

A large quantity of sand was used at first, but it was found that the sand did not mix and flow readily with the water and that adobe, when mixed very thin, flowed much better. Consequently a thin mixture of adobe and water has been emptied into the hole night and day for nearly two months, to the present writing, at the rate of about 12 tons of adobe in 24 hours.

Occasionally, the barrel would be filled with water only, several times in succession, and this allowed to run into the hole to wash away the adobe that would collect and cake at the bottom, owing to the great heat. Several times, also, it was found necessary to again drop in the drill to clear out the hole.

As the lower part filled up, the casing and pipe were raised until they reached the No. 3 vein. While a quantity of water comes through the roof and runs into the mine, the amount thus entering is not alarming, in fact not as much water is coming through as was expected and, though a careful watch is maintained both day and night underground, thus far there have been no ill-effects in the mine from the hundreds of tons of mud and water that have been poured down the drill hole.

Of course, at this time, it cannot be definitely determined whether or not this method of fighting the fire will be entirely successful, but, as the temperature in the troubled territory has been practically cut in half, there is every reason to believe that the final result will be all that can be hoped for.

In the accompanying illustrations, the nearer view shows the barrel used as a funnel and attached to the valve which, in turn, is attached to the pipe within the casing. The mixture of water and adobe is being poured into the barrel from the mixing box and the man at the valve is just opening it to allow the mixture to run into the hole. The other illustration gives a general view of the drilling machinery and engine.

Coal for Sicily

In the *Daily Consular and Trade Reports,* under date of Sept. 24, American Consul Samuel H. Shank, located at Palermo, Italy, in commenting on the Sicilian fuel needs says in part:

In the past, England has supplied almost all the coal for Sicily. In 1913, the total imports at Palermo amounted to 211,680 tons, of which 206,470 came from England. The United States supplied only 5210 tons.

Present indications, however, would seem to be favorable for American exporters to get a start here, which should eventually give them a share of the business. It is difficult to get consumers to change from one coal to another, but should the war continue, it may not be possible to get a sufficient supply from England.

Cardiff and New Castle coals are used more than any other. Some anthracite is shipped from Swansea. The greatest amount of coal is used for steaming purposes and for manufacturing gas. Very little coal is used by private individuals, as most of the cooking and heating is done by gas or charcoal.

The usual price of Cardiff coal has been $6.80 per ton, c.i.f. Palermo, and for New Castle $5.60. The freight from England has in the past been $2 a ton, and there is no duty.

Many inquiries have been made at this consulate, and one concern has cabled to the United States for prices. Persons interested in the matter should send analyses of their coal, and quote prices if possible c.i.f. Palermo. Proposals may be directed to this consulate, in which case they will be put into the hands of the parties interested.

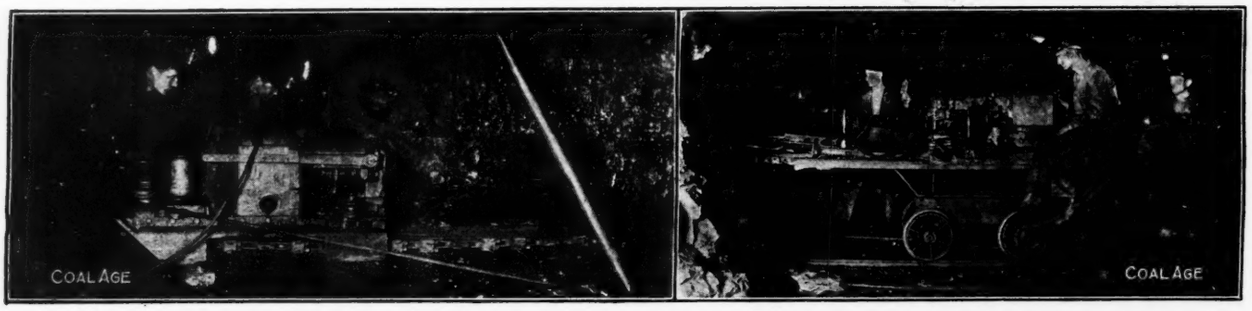
Coal-Cutting Machines in the Anthracite Region

By M. S. Beddow*

SYNOPSIS—The chain undercutters used with success in bituminous coals had to be redesigned when subjected to the heavier stresses incident to operation in anthracite. These machines are, however, doing much to render profitable the working of thin coal measures.

Four or five years ago, had a person mentioned coal-cutting machines in connection with anthracite mining, he would have been laughed to scorn. These have, however, been given a fair trial and except for a few minor details have not been found wanting. Mechanical cutting of anthracite has ceased to be an experiment, as operators throughout the entire field have come to believe that it is the only successful way in which to mine the thinner, and hitherto unprofitable coal beds.

Nor is the use of mechanical cutting confined to coal measures of only 28 or 30 in. thickness, although it is quite true that it is here that the chief benefits are derived, due to the large amount of rock which formerly had to be removed as compared to the tonnage of coal secured.



A Morgan-Gardner Mining Machine Making a Sumping Cut and Entering a Chamber under Its Own Power

After proving conclusively that chamber, or short-wall, mechanical cutting was perfectly possible, further experiments were conducted along the line of long-wall mining. Here also success was secured. Under the old method of mining some of the smaller coal beds, it was found necessary to remove four or five feet of rock in order to secure about half that thickness of coal. At the present time, however, this rock save in the gangways and airways is allowed to remain.

During the experimental stage when each coal-cutting machine manufacturer was anxious to "make good," it was discovered that if mechanical cutting was to prove a success, a number of changes would have to be made in the machine design. In other words, the coal cutters as they were turned out for use in soft-coal measures would not answer for use in the anthracite field.

In the first place, the chisel-pointed bit, which is exactly what its name implies, was found to take too great a bite in the coal, and was therefore liable to place an excessive load on the motor. The pick-pointed bit was then adopted, and is now doing effective work almost universally. Furthermore, the cuttings or "bug dust" made by a chain using this latter type of bit is not nearly as fine, as when chisel-pointed bits are employed and consequently contains a larger percentage of salable sizes.

This fact is apparently insignificant, but the smaller the coal which is produced at the working face, the less chance there is of its reaching the breaker where it is prepared for market, since, the small stuff, is lost through the crevices in the cars on its journey to the foot of the shaft. A large percentage of this dust, however, which does reach the breaker is made into buckwheat and smaller sizes, the profit from which is, to the producer, negligible.

The Cutter Bar Was Weak

The next difficulty encountered was with the cutter bar around which the chain carrying the bits above referred to revolves. In particularly hard measures, the bar as constructed for soft coals has been known to bend badly. This part of the machine was accordingly enlarged and its quality improved. Other alterations, such as stronger cutting chains, bits harder tempered, heavier gearing etc., were made before the mechanical end of the machine was satisfactory.

It will be at once perceived that the above reinforcement would necessarily compel a corresponding change in the electric drive. A marked increase was shortly noticed in armature, field, controller and resistance troubles, but the remedy was not as simple and easy as in the former case, since it required more time and thought to alter a whole motor equipment and its accessories, than to strengthen a partially weak mechanical equipment.

The electric drive, had, like the cutter bar and chain, been originally constructed for operation in soft-coal measures, consequently, when it encountered the harder anthracite, the current taken by the motor increased in direct ratio with the increased difficulty in cutting. When it is considered that the heat generated in the armature and field winding increases with the square of the current, one is enabled to understand how much extra heat had to be dissipated, even supposing that anthracite cutting is only twice as hard as bituminous. An increase in motor rating from 30 to 50 hp. shows how the difficulty of cutting increased in passing from the soft- to the hard-coal regions.

*Scranton, Penn.

Two Methods of Cutting Employed

There are two methods of cutting in use in the anthracite field. These are the chamber, or short-wall, and the long-wall. In the former, the machine enters the working place, passing from the truck to the extreme right-hand rib. It then sumps the full depth of the cutter bar, the length of which ranges from 5 ft. 3 in. to 6 ft. When the sumping cut is complete, the machine is drawn across the face of the room to the opposite rib, this being accomplished by means of a cable or chain attached to a jack at the left-hand side of the room. The speed of cutting is from 12 to 18 in. per min., while the places vary in width from 26 to 30 ft.

As above stated, the actual cutting is done by a rapidly moving chain which carries a series of bits, which are turned at different angles to the plane of the cutter bar. The bits are so positioned that the width of the cut is slightly greater than the thickness of the bar so that the latter moves freely under the coal, placing no extra strain on the driving mechanism.

Cutter bars as now employed range in thickness from 2½ to 4¾ in. and the bits in order to give clearance for the bar cut a kerf slightly wider than this. After the undercut is complete, the machine pulls itself back onto the truck, and, under its own power, moves to the next room or chamber where the same operations are repeated.

After a place is thus undercut, and the machine and its operators have passed on, the place is turned over to the miner and his laborers who proceed to drill the necessary holes, blast down the coal and load it out into mine cars. The rock is then removed from a sufficient width and depth to allow the advance of the rails, cars, mules, or locomotives, as the case may be. This rock is also loaded into cars, or where there is sufficient room gobbed. In this respect, the long-wall method has the advantage, for the rock, save that in the gangway and airway, is here allowed to remain.

In the short-wall, or chamber method of mining, the track must follow the miner the complete length of the room. This necessitates the removal of sufficient bottom rock to give clearance for the car. It will, therefore, be easily seen that the cost of removing this dead material is sometimes enormous. Furthermore, this must be done in each chamber or working place in the mine.

There Is Less Dead Work with the Long-Wall Method

In the long-wall method of operation, the rock on the main gangway only is removed to give a total height of about 6 ft. The machine undercuts along a face 215 ft. in length, and this entire amount of coal is then drilled and shot down. An endless-chain conveyor driven by a 10-hp. motor is operated along the base of the broken coal. The latter is loaded into this conveyor, which transports it to a waiting car on the gangway.

When the conveyor is fully loaded, and the motor which drives it is running at its highest speed, a car can be filled in from two to three minutes, depending upon the car's size. Enough coal is undercut in the night shift to supply the loaders with plenty of work for the next day.

This performance is repeated day after day, a pillar of coal being left only when the roof becomes so unmanageable that the cribbing fails to hold it in check. In this event, the entire face of the long wall is removed to a point about 30 ft. in advance, the intervening coal being left to support the roof, which settles evenly on either side until it again finds a resting place.

It is not often that this inside disturbance is felt on the surface, for due to the system of cribbing employed the roof only settles for about 30 in. and that quite evenly. From 60 to 70 cars are obtained per day from a long-wall face of the length above mentioned.

In closing, I wish to bring out a thought which has not hitherto been mentioned in this consideration of methods of cutting anthracite coal; this is the evident decrease of accidents of all kinds which has acompanied undercutting as compared with shooting the coal from the solid. Formerly where coal was extremely hard, requiring heavy shots, large pieces were frequently blown for considerable distances, and sometimes carried destruction in their paths. With the present methods, the natural tendency of the coal is to fall from its own weight, and it is seldom that, even under the action of the explosive, it leaves the chamber proper.

I predict brilliant future success for coal-cutting machines and methods in the hard-coal fields.

Cables in Bore-Holes

By C. M. Means*

Bore-holes offer a safe and convenient method of transmitting electric power from the surface to the underground. Cables can be caried on the surface and down a bore-hole located at or near the point where power is actually required and at such voltages as best suit the conditions. Circuits having potentials up to 6600 or even 13,000 volts can be handled safely in this manner. To attempt to transmit power at these high voltages along headings underground would introduce an element of danger or the cost of installation would be prohibitive.

The advantages are in favor of a bore-hole for this purpose, as compared to any other method, whether the mine be a drift, slope or shaft operation. In small drift mines, this might not apply but if the mine covers any extensive area or requires considerable power, the bore-hole method of entering the workings with electric conductors is to be recommended.

Except in the case of great depths, a bore-hole should be used at shaft mines and should be so located that no main conductors would be near the bottom of the shaft, which is usually congested.

Cables supported in shafts introduce a certain element of danger from fire or accidental contact by persons working in their vicinity. Furthermore, the cables are in an exposed condition and subject to mechanical injury.

Cables properly installed in bore-holes offer a higher factor of safety and reliability than is secured by any other method. There have been a number of failures of cables in bore-holes, but in the cases investigated the difficulty was found to be due to improper installation and not defective cables. The manufacturers are in a position to produce cables with a high factor of safety, but all their skill and care in manufacture are lost if the bore-hole is not properly arranged for the service or the cables be not properly supported.

A cable in a bore-hole will have the same degree of reliability as a cable installed in a similar length of pipe or conduit on the surface, if a good bore-hole is provided, and the cables supported in a proper manner.

The casing in such a bore-hole should be of sufficient

*Randolph-Means Co., Pittsburgh, Penn.

size to contain all the cables necessary without crowding and should be smooth on the inside so as not to cause abrasion of the conductors while they are being lowered into position. The casing should, therefore, be prepared in the same manner as iron conduit used on the surface for a similar purpose.

All joints should be made waterproof so that no water even under pressure can leak to the inside. Sufficient space should be left around the pipe to allow at least one inch of concrete to be placed between it and the inside of the drill hole. It is important that this concrete be continuous throughout the entire length of the pipe. Care should be taken around the bottom of the hole to see that the concrete shuts off all moisture and when the hole is complete no water should leak from the strata around the pipe.

The method of support will vary with different installations, depending on the depth of the hole and kind of cable used. With holes up to 500 ft. in depth, no difficulty should be encountered in securing a proper support for any cable, but beyond this length they should be specially designed for the work they are to do.

Cables insulated for the required voltage with good weatherproof covering have proven highly satisfactory where properly installed. Ordinary lead-covered cables have no place as conductors in a bore-hole because of the difficulty of support. Special armored cables are desirable for the higher voltages, but in every case should be designed for the particular work required of them.

The weight of low-voltage cables is largely represented by the conductor and this has sufficient tensile strength to support quite long lengths. If the factor of safety is not great enough with soft-drawn copper, this can be increased by using hard-drawn wire, aluminum or a steel center. For all low-voltage work, single-conductor cables are preferable.

In many cases, it will be found advantageous to use single conductor weatherproof covered cables for high-voltage installations, supporting their weight by the conductors themselves. Armored cables should be employed where multiple conductors are desirable and the armor utilized for supporting the weight.

If it is desirable to hang an armored cable at more than one point, the supports must be equalized so that there is no danger of the total weight coming on any single point of suspension. In general, the conductor should be designed for only one point of support and this can be accomplished by using a proper cable.

Cables in bore-holes should be subjected to frequent inspections, and examinations made for leaks or moisture, as it is important that the inside of the bore-hole be kept dry at all times. Air should not be allowed to circulate therein unless the temperature of the air going into the pipe is lower than that of the walls. Bore-holes can be dried out during the winter by allowing cold air to pass down the holes, as in expanding it will take up the moisture.

The use of single-cable conductors is suggested because of the ease of repairs. At the ordinary mine, material is usually kept on hand wherewith to make repairs to the ordinary insulated cable with weatherproof covering, but few operations have the facilities for repairing armored cables.

Inasmuch as a single bore-hole is often depended on for the entire supply of power to a mine, it is not only important to have a high factor of safety, but the entire design should be such as to admit of easy and quick repairs in case of an unusual accident.

Extracts from a Superintendent's Diary

Whenever I visit the city and am pursued by the numberless beggars flaunting deformities of every imaginable description, I am always reminded that I have yet to see my first beggar at a mining camp.

We have plenty of cripples and dependents, but the generous spirit of the community somehow always relieves these unfortunates from the necessity of begging. The same statement could probably be made of any restricted community. If all vagrant beggars could be persuaded to continue their residence in the place where misfortune overtook them and reduced them to a state of justifiable beggary, there would soon be no beggars. We have not yet become so niggardly that we neglect the unfortunate whose life history is familiar to us.

Some people use this line of reasoning to prove that all beggars are impostors, but I cannot agree with them. Unfortunates, like all other classes of human beings, sometimes are possessed by the wanderlust and naturally, when one who is unable to earn his living finds himself out of reach of kith and kin, he becomes a beggar automatically.

Such a one was buried in our town today.

Ten years ago Tom Flemming was an average coal digger. Then he walked back on a dynamite shot in his heading and found himself minus one arm and both legs, after the surgeons dismissed him from the hospital. The following year he received $2000 in court and remained on a spree for about six months. Within two months' reckoning from the day he became sober, he was penniless. But he was not compelled to beg. One of the small merchants on the edge of the camp decided to handle explosives and put Tom in charge of the sales on a commission basis. This was a strictly commercial proposition and it proved to be a good business deal for the merchant. For several years Tom's earnings were in excess of his previous earnings as a miner.

In the early part of his life, Tom had been a great wanderer and now that so much of his time was unoccupied, he thought often of his early experiences and the places he had visited and the people he had known.

If the men who bought their supplies from Tom could have read his thoughts during this period, the final tragedy in his life could probably have been averted, but they did not and so one fine spring morning Tom did not report for work, but instead, started off on a long journey.

For a time we had tidings from him in round-about ways, but eventually he got out of touch with everyone he had ever known.

Again he capitalized his deformities, this time as a common street beggar. Back home when the boys patronized Tom because of his infirmities, they did not allow him to feel that sympathy had any part in the transaction, but now his patrons had no scruples in the matter. In fact, they were constantly asking all kinds of questions and expressing all kinds of doubts before offering their pitiful pittances.

Poor Tom had only one hope remaining and that was to be buried back home.

Just how he managed to get back remains a mystery.

The Proving of Mine-Rescue Apparatus

By R. Dawson Hall

SYNOPSIS—An account of an instrument for testing the condition of mine-rescue apparatus, not in an emergency but at regular intervals.

The value of mine-rescue apparatus depends entirely on the condition in which it is kept. If it is allowed to get out of order, when the time comes to use it, it will not be available. The tests should be made, therefore, at regular intervals, and these should be more thorough than those used prior to actual mine-rescue work, which are necessarily hurried and superficial.

The meters illustrated below test all the parts of the breathing apparatus. Mounted on a common stand they

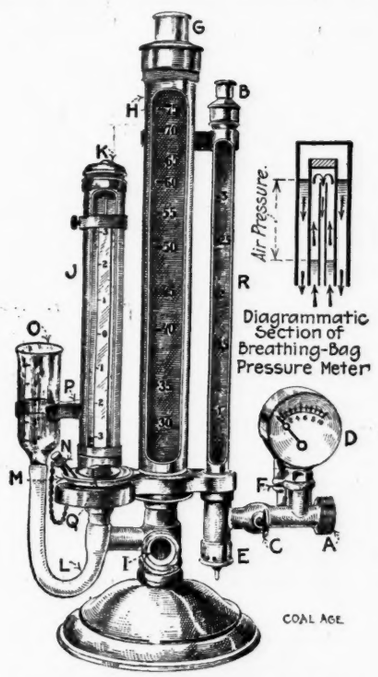


Fig. 1. Instrument for Testing Breathing Apparatus

are conveniently available; no parts are likely to be lost and no tests are apt to be overlooked.

The Quantities Needing Measurement

Such an apparatus should test (1) the quantity of oxygen which the reducing valve delivers, (2) the pressure at which the oxygen is delivered, (3) the amount of air which the injector will draw through the apparatus, (4) the pressure under which the air circulates, and (5) the pressure at which the relief valve of the breathing bag will lift. There is an appropriate meter supplied to prove all these various characteristics.

The tube *R* and the pressure gage *D* on the right, Fig. 1, are for the purpose of testing, not the working of the apparatus as a whole, but simply the action of the reducing valve of the oxygen cylinder, to ascertain whether that valve passes the needed amount of oxygen and delivers it at the correct pressure.

To prevent the reader from misapprehending the functions of the various parts, we have illustrated that section of the breathing apparatus which is tested with the part of the testing device by which it is measured, omitting all other parts. It may be stated, however, that the apparatus as built cannot be thus divided physically into various parts.

Volume of Oxygen Passing

The reader should now concentrate his attention on Fig. 2. The end of the air-supply hose where it normally enters the breathing bag is screwed on the connection *A* of the testing apparatus. The cap *B* is removed and the cock *C* opened wide. The opening by which, under normal conditions, air is admitted on the side of the injector, is closed by screw cap *S* and the valve is opened to the oxygen cylinders. The oxygen is thus

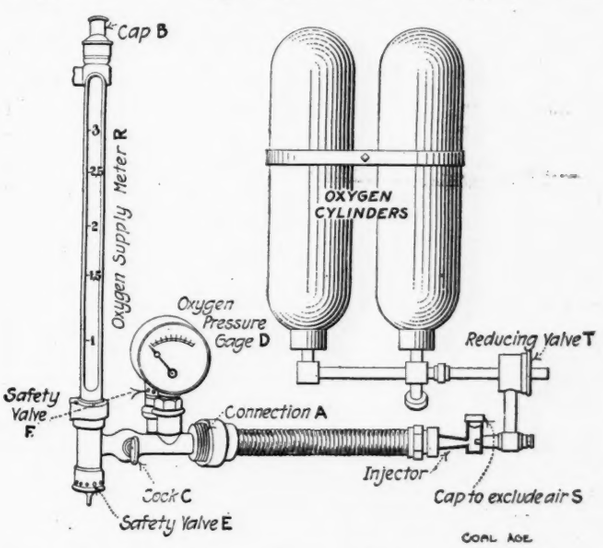


Fig. 2. Connections When Measuring Oxygen Supply and Pressure

able to pass from the oxygen cylinders, through the reducing valve *T*, the injector and the air-supply hose into the testing apparatus. It cannot, of course, in this passage augment its volume by drawing in air, because of the screw cap just referred to. This oxygen has sufficient volume to lift, in the oxygen-supply meter *R*, a small truncated cone, which measures by its rise the quantity of oxygen thus passing. The oxygen delivered should be two liters per minute and the spheroid should stop with its upper edge at the figure two. The tube of the meter is graduated so that the amount of oxygen passing when between one and three liters per minute can be accurately determined. It is absolutely essential that the cap *B* be removed, for the mensuration depends on the movement of the air and moreover the glass of the meter is not strong enough to sustain the full pressure

delivered by the reducing valve. There is, it is true, a safety valve at *E*, but the experimenter should not rely on it to remove this pressure.

Pressure of Oxygen as Delivered to Apparatus

For the next test, that of the pressure of the oxygen delivered, the arrangements are identical, but as the static pressure is far greater than that reached when the oxygen is allowed to pass away unrestrained, an armored tube, capable of sustaining a higher pressure, is used instead of the regular air-supply hose to lead from the injector to the connection *A*. The cock *C* should be closed. Be sure that the cap *B* is not replaced till the cock *C* is turned against the entrance of air. In fact the function of the cap *B*, which is to keep the apparatus clear of dust when the oxygen supply is not being tested should be kept in mind. It is no more an integral part of the apparatus than the box in which the whole device is packed.

The oxygen being prevented from escaping by the closing of cock *C*, the oxygen-pressure gage *D* shows the pressure supplied by the reducing valve in atmospheres. This should read about 6 and if it does not the reducing valve should be adjusted and the flow of oxygen redetermined.

Volume of Air in Circulation

The central tube of the metering device, Fig. 1, we are describing, measures not the oxygen but the air and oxygen combined, that is, the enriched air circulating in the apparatus. Fig. 3 represents the arrangements for such measurement. The cap *G* is removed on the top of the air-supply meter *H*, and the end of the air-supply valve is screwed to the connection *I*. The cap *S* which was placed in the first tests over the air inlet in the side of the injector is, of course, removed. The air and oxygen entering the glass air-supply meter *H* raises a truncated cone within it, which measures the quantity passing. This should be from 50 to 65 liters per minute, the glass face being graduated to read in those units. The test may be made with the entire apparatus connected up so that the air drawn in must pass through the exhalation and air-discharge hoses, the regenerator and the cooling tube. This will interpose some additional resistance and the injector will, therefore, provide less circulation.

Pressure Producing Air Circulation

The pressure in the breathing bag is measured with the same connections. The oxygen supply is first cut off, however, by closing the valve of the oxygen cylinders, and after removing the cap *K*, the meter *J* is filled with colored alcohol or colored distilled water to about its mid-position, and the cap *K* replaced. There are three concentric tubes in this part of the apparatus. The liquid enters the outer tube, and rises from the base of the middle tube till both are filled to the same level. This middle tube is closed at the top and the air escapes by the innermost tube, as shown diagrammatically on the right of Fig. 1. An adjustable scale is set to read zero at the water level. On opening the reducing valve, the air entering at the innermost tube presses the liquid down in the middle tube and raises that in the outer, the water column thus created balancing the pressure of the air. The readings above and below the zero added together give the pressure of circulation which should be about 3.9 in., or 10 cm. Similarly the suction can be determined by connecting the breathing-bag pressure meter with the discharge hose.

Why the Relief Valve Should Be Sensitive

It is important that the relief valve in the breathing bag prevent the air pressure from becoming too high or from discharging till the pressure reaches the required figure. For if the pressure at which the valve operates is too low, the breathing bags are liable not to be sufficiently filled with air and breathing will be difficult. Some claim that the pressure in the bag should not be too low or otherwise if there are any invisible leaks in the apparatus, carbon monoxide may pass in when the wearer

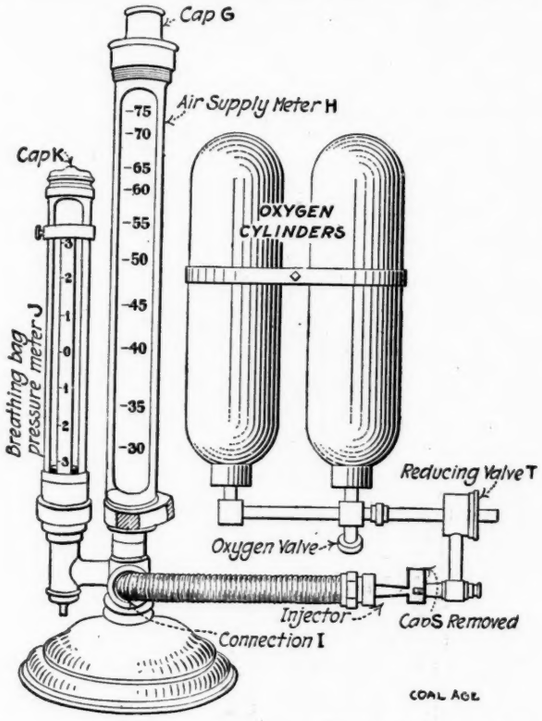


Fig. 3. Arrangement When Measuring Air Supply and Pressure

is working in an atmosphere where such gas is present.

Nor is excessive pressure desirable, as exhalation will be difficult and the effort will exhaust the wearer. It is desirable that he have the minimum resistance which is necessary for safety in breathing in and breathing out. The relief valve is intended to regulate this and its sufficiency as a regulator should be measured.

Testing the Relief Valve

To measure the pressure at which the relief valve will discharge, a relief-valve meter *O* is placed on the side of the apparatus. This is connected by a rubber tube *L* to a dish *M*. In the center of the dish projects the end of a metal tube *Q*, which is open at both ends. This tube is connected at its lower end with the rubber hose *L*. No connections are made with the apparatus. Only the relief valve is disconnected and tested when the meter is ready for operation.

The measuring glass *O* is lowered in the bracket *P* till the zero point of the scale on its side is level with

the upper edge of the bracket. Water is then poured into the glass until it flows out of the top of the metal tube *Q* into the basin. The measuring glass is then lowered slightly so that the water falls in *Q*. The relief valve from the breathing bag is then screwed over the end of the tube. Care should be taken that the valve seat is absolutely dry, as moisture may cause a false reading.

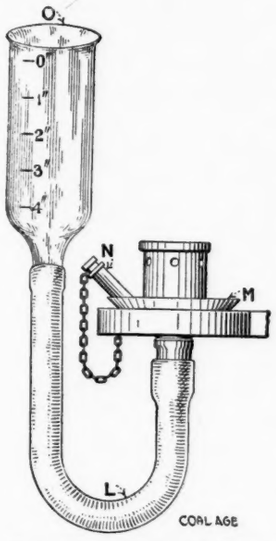


FIG. 4. MANNER OF TESTING PRESSURE AT WHICH RELIEF VALVE WORKS

The measuring glass is then slowly lifted until the water flows out of the hose in the upper part of the relief-valve casing. The pressure at which the valve releases will correspond with the number of inches the measuring glass is lifted. The water should begin to escape when the measuring glass has been raised about 1.2 in. (or about 3 cm.). The plug *N* can be pulled out and the water will thereupon run back into the measuring glass *O*.

This apparatus is made by the Maschinen-Fabrik Westfalia, at Gelsenkirchen, Westphalia, and is sold by S. F. Hayward & Co., 39 Park Place, N. Y. The device is suited to the testing of all forms of apparatus, except that the relief-valve meter is specially adapted to the proving of Westfalia apparatus, though it could be slightly modified so as to make it suitable for relief valves of other patterns.

Mine Regulations to Reduce Liability to Explosions

The following points in respect to reducing to a minimum the liability to mine explosions are sent by a mine foreman of long experience.

VENTILATION

1. Have exhaust system of ventilation.
2. Use explosion doors on fan.
3. Current must be neither too strong nor too weak.
4. Use 4- to 6-entry system, work in panels, keep air courses clear of obstruction.
5. Use overcasts instead of doors; if doors, use automatic.
6. Have stoppings substantially built of masonry and kept in good repair, check doors at necessary intervals so that ventilation reaches the face of workings.
7. Use separate splits freely, have all abandoned workings thoroughly ventilated.
8. Have ample ventilation exceed the requirements of the law if necessary.
9. Install duplicate fans and engines so that they can both be used together if necessary.
10. In all narrow work crosscuts should be driven at least every 100 ft., if driven every 200 ft., the limit, and canvas is blown down it will accumulate a dangerous body of gas.

SHOT FIRING

1. Employ skilled shotfirers acquainted with the extreme danger of gas and dust.
2. Use permissible explosives, copper bar and needle and clay tamping, fire one hole at a time with a battery when all men are out of the mine, commencing to fire shots, advancing against the air.
3. Do not shoot off the solid or holes drilled beyond the undercutting, shoot center hole first. If coal is 5½ ft. high and place 10 ft. wide shear one side or shoot in two layers.
4. Do not overcharge shots or use mixed explosives.
5. Holes must not exceed two inches in diameter.
6. Carefully inspect places for gas before shooting and after for fire, bad roof and gas.
7. Wet sides, roof and bottom for 80 ft. back before shooting.

DUST

1. Use sprays to wet the coal in the cars and spray empty cars outside or at the shaft bottom.
2. Keep rooms and haulage ways clear of dust by loading it out, keep coal below beds of cars.
3. Use water or exhaust steam for moistening dust.
4. Before shooting, wet sides, roof and bottom for distance of 80 ft.
5. Use tight wood or steel cars to prevent leakage of coal and clean it up regularly before it is ground into powder.
6. Dust is dangerous, because when acted upon by a flame, it generates carbon monoxide, it absorbs oxygen out of the air.

GAS

1. Do not allow mixed lights in a mine generating explosive gas.
2. Examine all places regularly and thoroughly for gas.
3. Do not allow accumulation of gas in worked-out portions of mine.
4. Consult the barometer for changes in the weather.
5. Employ competent and trustworthy firebosses and assistants.
6. Drawing stumps and pillars, take the coal out clean so roof can cave.

MISCELLANEOUS

1. Have good discipline in the mine.
2. Systematic timbering of working places to suit conditions.
3. Mine foremen, assistant mine foremen and firebosses must all be sober, competent and respected men and see that they observe fully the requirements of the mining law.
4. Have danger signals printed in all languages spoken at the mine.
5. Have accurate surveys made of the worked-out or abandoned sections of mine.
6. Instruct all classes in the danger of mining.
7. At least instruct all company men in First Aid and use of helmets.
8. Prohibit electricity in a gaseous mine and carefully guard its use in a nongaseous mine.

9. Use stone dust to deaden coal dust explosibility.

10. Work all rooms on retreating system.

11. Prohibit the breaking of large pieces of rock by laying dynamite on top of it, do not allow shots to be fired in air courses, headings and traveling ways unless wires are properly guarded, men warned and dust wetted.

12. In gaseous mines work rooms from one side only.

13. Shear and undercut coal properly before shooting.

Mine-Telephone Apparatus

The application of telephone systems to the mining industry is a comparatively recent one, but notwithstanding this fact the mine telephone has been highly developed. The requirements for constant and dependable service under all operating circumstances are exceptionally severe, in fact, it is safe to say they are unequaled by any conditions met with elsewhere in telephone operation. A brief review of these conditions and the manner in which they have been overcome in the design of modern mine-telephone equipment will be of interest to both the engineer and layman.

In general the greatest hazards to which telephone instruments employed underground are subjected are mechanical injury and the corrosive effects of acid mine waters and gases. Some of the mechanical sources of injury are falling roof materials, the concussion of blasting and rough handling by careless workmen. All these must be guarded against with a large factor of safety and each part must be given special treatment so that it will faithfully perform its functions.

A representative type of mine telephone as built by the Stromberg-Carlson Telephone Mfg. Co., is shown by Fig. 1. In this particular type of instrument, all of the apparatus is contained within a cast-iron box which has walls of ample thickness reinforced at the edges and corners to give adequate protection against injury. The operating parts are mounted inside an inner compartment, sealed by a door which is provided with a wide felt gasket. This compartment need not be opened except about once a year to replace the dry cells. As an additional safeguard against the entrance of air and moisture when the set is not in use, the outer door is fitted with a tubular rubber gasket which is compressed under the action of the door-lever mechanism.

The dome-shaped casting on top of the box shelters the gongs, gong mountings and armature assembly. The gongs are 4 in. in diameter so as to give a loud, clear signal and are triple zinc plated to render them corrosion proof. In mounting the ringers, so that no opening is made in the roof of the inner compartment, a unique scheme has been employed. By referring to the illustration, it will be noted that the ringer coils are inside the case with their magnet cores brought up through a brass plate.

As the clapper rod is mounted in a manner just the reverse of the usual arrangement it will be seen that there is no opening which might admit moisture. All of the ringer adjustment is made on one screw which is accessible by removing the dome.

Another feature which goes to show the importance of air-tightness is the manner in which the generator crank is brought through the inner door. The generator is equipped with a detachable coupling which separates when the inner door is opened. The section of the shaft which goes through the door itself is packed by means of a stuffing-box.

The equipment of these instruments includes the same operating elements as a regular magneto instrument, but the parts are in themselves especially designed for underground service and are consequently built heavier. The transmitter is of the long-distance type made up so as to be water-tight. The receiver is of standard form having a moisture-proof cord.

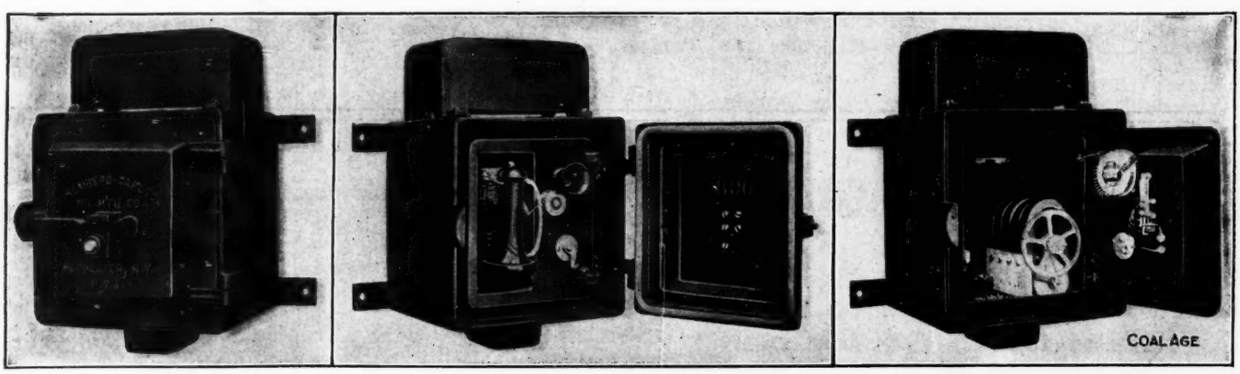


FIG. 1. THREE VIEWS OF A TYPICAL MINE TELEPHONE

A take-up device which is plainly shown in Fig. 1 draws the cord away from the door when not in use so that it will not be cut when the door is closed. A five-bar hand generator furnishes alternating current for ringing while the energy for talking purposes is drawn from two dry cells. The hook switch is not operated by gravity under the weight of the receiver but is actuated by wedging the receiver between the double jaws of the hook.

In general, all parts in the magnetic circuit of the set are made of iron which is given a zinc or copper plating. All other parts, including the screws, are of brass. Each coil is impregnated with a solid compound which successfully resists the action of mine gases and liquids and it is said that such mine telephones can be entirely submerged without injury to the apparatus.

The Nanticoke District Mining Institute, Nanticoke, Penn., will hold its fourth annual dinner at the State Armory, Saturday evening, Oct. 10 ,1914, at 7 o'clock. D. L. Morgan is secretary.

American Mine Safety Association

Special Correspondence

SYNOPSIS—The attempt of the American Mine Safety Association to hold a business meeting in New York City was a complete failure, but the meet at Terre Haute was an entire success and served to initiate an important safety movement through the State of Indiana. Teams attended from Pennsylvania and Illinois.

It is always difficult to forecast what will be the effect of a change in the method of conducting the business of a society and this was made distressingly evident in the recent attempted meeting of the American Mine Safety Association in New York City. Unfortunately the business session has always been too strictly business-like. There has been little deliberation regarding first-aid methods, almost none about mine rescue, and safety has been forgotten. Nearly all the discussion has been about organization and the most exciting part of the proceedings has been as to the person who should be presiding officer and to the time of paying dues.

Whenever anyone has suggested discussing first-aid methods, someone has objected to submitting matters of that kind to a mixed body of doctors and laymen, and there the matter rested. As none of the meetings really "tended to edification," if we may quote the evangelical formula, there has been a growing dissatisfaction with the business meeting, though the feeling had little to do with the real progress of the association.

No Discussion of Principles but Much Commendable Activity

In brief, the society has been short on dogma and quite long on practice. The first, as exemplified at the New York City session, was a failure, the second, as portrayed at Terre Haute, Ind., was, as usual, a success. When the meets were held in the same place as the business meeting, they served to help out the latter and give it a semblance of life which intrinsically it did not have.

But dogma is useful. We feel that first aid, and, in a lesser degree, mine rescue, also has need of much of it and safety has a literature which has not at all been extended by the society which calls itself a Mine Safety Association.

We need to discuss and define how first-aid work should be done, perhaps also we need to prescribe just how it shall be performed at contests. The teams are often demerited for doing "what the doctor ordered," and one judge will approve what another will condemn. Such a conflict is common in all branches of art and industry, but it is folly to subject men to a loss of credit because they have done something which they have been taught to do and performed some act which no definite regulations forbid.

If there is going to be criticism of "doctor's orders," we think it will show itself most forcibly where no method is prescribed by authority and if every doctor who acts as a judge is permitted to use his own judgment. The clashes of authority will be felt most severely if those who suffer from the conflict are those who can have no hand in the settlement. If the doctors proverbially differ, it is not well to make the first-aid men they train get the burden of the disagreement by demerits in the judgment of contests.

Why Not Some Interesting Papers?

Sometimes we wonder whether a few papers read before the association would not serve a good purpose. We are convinced that there are too many papers presented already at public gatherings, that many had better have never been penned and most had far better been penned than delivered, but if papers could be volunteered or the right man asked to deliver them, it seems that interest would be added to the meetings, and perhaps also, as the association appears to have forgotten it, it might be well to call the attention of the members to the fact that it is true of the association that "safety is its middle name." A few addresses on methods of making the mine safe would surely not come amiss.

The meeting met on Sept. 7, Labor Day, at the Waldorf-Astoria, the president and secretary and about a dozen others being present. The next day fifteen first-aid and rescue men of the Lehigh Valley Coal Co. made an excellent exhibition in the Waldorf-Astoria, at which about as many members as exhibitors were present.

Vandalia Coal Co. Team No. 20, Linton, Ind.

The Lehigh Valley Coal Co. generously sent the Westmoreland team and the captains of the best teams in each of the five divisions in charge of Efficiency Engineer John Lloyd, and kept them in New York City three days, giving them a good opportunity to see and enjoy the town and paying their way to places of entertainment. The appreciation of the company for the good work of its men has made them most enthusiastic adherents of the safety movement.

On the 9th, the Delaware, Lackawanna & Western R.R. coal department sent a first-aid and mine-rescue team from the Central Mines, with the superintendent, T. J. Williams, and the rescue foreman, John A. Thomas, in charge. Owing to the fact that the meeting was called to an early close, this corps brought no equipment, but spent two days in New York City visiting places of interest.

Business Meeting at Terre Haute, Ind.

In the afternoon of Sept. 11, the executive board of the American Mine Safety Association met in the rooms of Terre Haute House, Terre Haute, Ind. The annual meet-

THE LINE-UP OF TEAMS AND OFFICIALS AT THE MEET OF THE

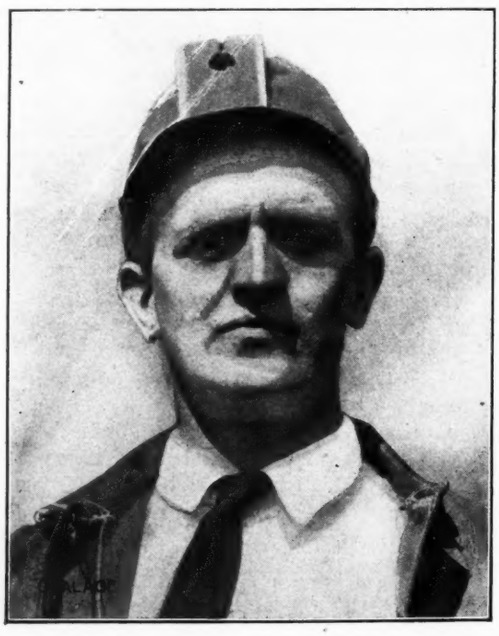
ing was held in the evening at the Chamber of Commerce with John P. Reese presiding. The principal officers elected for the succeeding year were President Dr. August F. Knoefel, chief surgeon, Vandalia Coal Co., Terre Haute, Ind.; First Vice-President, Joseph Fletcher, Cherokee-Pittsburg Coal & Mining Co.; Second Vice-President, F. W. Sperr, professor of civil and mining engineering, Michigan College of Mines, Houghton, Mich.; Third Vice-President, William Green, Secretary-Treasurer United Mine Workers of America, Indianapolis, Ind.

The other members of the executive committee are as follows: W. H. Aldrich, managing director, Inspiration Consolidated Copper Co., 14 Wall St., New York City; Dr. Ralph McHenry, chief surgeon, Penn-Mary Coal Co., Heilwood, Penn., and Albert Burch, general manager, Goldfield Consolidated Mines Co., Goldfield, Nev.

REPORT OF SECRETARY SHOWS PROGRESS

The business meeting opened with a report by Secretary-Treasurer H. M. Wilson. It showed that on Sept. 1, the membership of the association was 549 and represented practically every part of the American continent. The association has awarded 101 medals since October, 1913, comprising 5 bronze mine-rescue medals, 10 silver first-aid medals and 86 bronze first-aid medals.

It was decided to appoint an organizer, who will devote his time to increasing the membership and whose salary will be a certain percentage of the dues. The members concluded to hold the next annual meeting at Philadelphia, Penn. A medal was voted to John C. Davidson, now an employee of the J. Wooley Coal Co., of Evansville, Ind. Mr. Davidson risked his life to save others at Starkville, Colo., Aug. 10, 1910, and again at Dawson, N. M., at an explosion which occurred Oct. 22, 1913.



JOHN C. DAVIDSON, WHO RECEIVED MEDAL FOR REAL RESCUE WORK

J. W. Paul, engineer in charge rescue department, Bureau of Mines, Dr. R. F. McHenry, chief surgeon, Penn-Mary Mines, and A. M. Ogle, president and general manager, Vandalia Coal Co., Terre Haute, Ind., were appointed on the general auditing committee. Dr. August F. Knoefel and Prof. E. W. Sperr were appointed a committee to audit the books of the secretary-treasurer. Dr. Knoefel, retiring chairman of the first-aid committee, recommended the adoption of the Shaeffer method of respiration in place of the Slyvester, and the recommendation was adopted. After much discussion, it was decided to give special medals to the "subjects" of all teams to which first-aid medals are awarded.

EVENTS ARE PREANNOUNCED

At 10 a.m., on Sept. 12, the field contests began in the Central League Baseball Park. Music was furnished by the American Federation of Musicians' Band, from Local No. 25.

The events had all been published before the contest. It is quite customary to publish the list from which the judges choose and this was done in this particular case, but strange to say, the events of the contest chosen for performance were all set forth at length in the morning papers before the meet commenced, so everyone had warning of what to expect.

LIST OF THE COMPETING FIRST-AID TEAMS

The teams competing were as follows:

Indian Creek Coal Co., Bicknell, Ind.; J. K. Dering Coal Co., Clinton, Ind.; Bunsen Coal Co., Westville, Ind.; Bunsen Coal Co., Universal, Ind.; Superior Coal Co., Gillespie, Ill.; Penn-Mary Coal Co., Heilwood, Penn.; O'Gara Coal Co., Harrisburg, Ill.; Vandalia Coal Co. No. 82, Terre Haute, Ind.; Consolidated Indiana Coal Co., Sullivan, Ind.; Knox Coal & Mining Co., Bicknell, Ind.; J. Wooley Coal Co. No. 2, Paxton, Ind.; J. Wooley Coal Co. No .1, Paxton, Ind.; Western Indiana Mining Co., West Terre Haute, Ind.; Lower Vein Coal Co., Terre Haute, Ind.; Green Valley Coal Co., Jasonville, Ind.; Sugar Camp Coal Co., West Terre Haute, Ind.; Vandalia Coal Co. No. 69, Terre Haute, Ind.; Vandalia Coal Co. No. 10, No. 1 team, Dugger, Ind.; Vandalia Coal Co., No. 20, Linton, Ind. (two teams); Vandalia Coal Co. No. 10, Dugger, Ind.; Monon Coal Co., Sullivan, Ind.; Vandalia Coal Co. No. 9, Linton, Ind.; Clinton Coal Co., Clinton, Ind.; Cambria Steel Co., Johnstown, Penn.; Superior Coal Co. No. 3, Gillespie, Ill.; Superior Coal Co. No. 2, Gillespie, Ill.; Calora Coal Co., Jasonville, Ind.; O'Gara Coal Co., Harrisburg, Ill.

The one-man event was: Treat a simple fracture of the right collar-bone and a simple fracture of the lower jaw. Time allowed, 20 min.

The two-man event required: Treat left leg lacerated by machine, flesh torn loose and bone exposed. Time allowed, 10 min.

AMERICAN MINE SAFETY ASSOCIATION, TERRE HAUTE, SEPT. 12, 1914

In the three-man event, the left ear of the patient was supposed to be torn off, the left shoulder dislocated and the left leg had a compound fracture. The time allowed was 25 min.

UNNECESSARY TORTURE TO PATIENTS AND SUBJECTS

There were, as before, many who put the torniquet on the thigh instead of at the knee, which is not the right place. They also tightened it. The pressure on the artery may be necessary or it may not. It is best to put the torniquet in place so that it can be tightened at any time. It is true that bleeding may occur and the first-aid man should be always prepared for it, but it is a mistake to say that a compound fracture always involves hemorrhage. It rarely does, according to the statement of physicians of experience, and the torniquet should be tightened only when necessary.

Consequently, first-aid men should learn to leave that instrument of torture loose if for no other reason than that the subject is apt to suffer no little pain if the judges are slow and the pressure severe. It is important to make the contestants realize that a torniquet is tightened not to *guard* against the possibility of bleeding, arterial or capillary, but only to prevent severe hemorrhage when it actually occurs. A loose torniquet should score always a better mark than a tight one.

The four-man event consisted of the resuscitation of a patient found unconscious from gas inhalation, with right forearm broken. A stretcher was improvised and the patient was carried 50 ft. The time allowed was 25 min.

DID NOT KNOW IF MAN WAS DROWNED OR SUFFOCATED

It is perhaps permissible to call attention to the fact that some of the teams treated their subjects as if the misfortune which had come to them was that of drowning. Not by any manner of means can lifting a man up and lowering him down by a grasp of his waist be said to be performing the Shaeffer treatment. There is, of course, some value in such a method of procedure; some tidal air enters and leaves the lungs, but there is not nearly the pulsating effect produced by pressure at the right point.

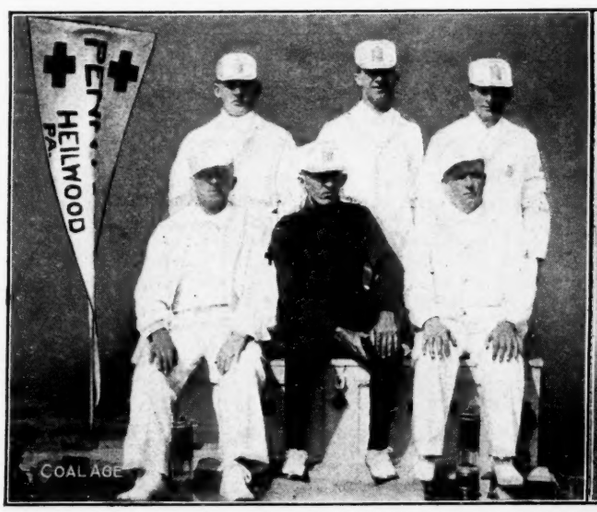
The first full-team event illustrated the treatment of a man found lying on a live electric wire, unconscious, with back burned at the waist line. Three methods of removal were to be portrayed and the man was to be treated and carried on a stretcher 50 ft. The time allowed was 30 min.

THE PENN-MARY TREATMENT OF A BROKEN BACK

The crowning exhibition was the treatment of a broken back by the full team. Time allowed, 25 min. The Penn-Mary team performed this feat as at the Pitsburgh meeting and the work excited general interest. But, altogether aside from the merit of the work from an anatomical point of view, and apart from the ingenuity of the dressing and the perfection of the bandaging, the action of the team was admirable from start to finish.

A little roughness with a man with a broken leg or a scarified arm may do but little harm. In fact, the chance to be rough and careless is not so manifest. But in preparing to bring a man out who has broken his back, there is every chance to be rough and clumsy without intention, and there is the greatest of danger to the patient if that awkwardness is manifested, and here again does first-aid become essential.

For this is essentially a full-team event. No physician could turn the trick alone. He is obliged to have a number of assistants, and we are confident he could not train them in the few minutes prior to the transference of the



FIRST-AID TEAM OF THE PENN-MARY COAL CO., HEILWOOD, PENN.

ONE OF THE FIRST-AID TEAMS OF THE CAMBRIA STEEL CO., JOHNSTOWN, PENN.

patient from the ground or the car to the splints. Only by taking his nurses into the mine could he give the patient that tender, considerate care which the first-aid men exhibit. The deftness of the Penn-Mary men was remarkable. There was a remarkable coördination of movement, the like of which one rarely sees.

When, however, 3F black blasting powder of equal deflective force, tamped with 2 lb. of dry fireclay, was used instead of the aforementioned explosive, the explosion was violent. It was evident that the coal dust which was again placed after the first experiment, took part in the action. Flame burst from the mouth of the gallery and

TWO SCENES IN MINE-RESCUE CONTEST

Rescuing a victim — Crossing over an overcast

Several illustrations are shown of the patient being dressed. It will be noted that it is anticipated that he will be found face down, whereas the general supposition as staged is that he will be discovered lying on his back—a most unlikely condition. The idea of the Penn-Mary dressing is to put the weight of the legs and arms on the splints and to carry these parts a pick is placed between the legs, other picks are placed in the arm pits and they are all deftly and securely attached to the splints.

THE GALLERY DEMONSTRATION

Not a little interest was shown in the steel gallery, which had been erected to show the dangers inherent in the use of black powder. In few places is the need of such a demonstration of the value of short-flame explosives more evident than in the State of Indiana. In the mines of that state, shotfirers are engaged, coal being largely shot from the solid and black powder seems universal. Thus the dangers of coal dust cannot be too strongly emphasized.

As at other meets, a shot of permissible explosive, having a deflective force of one ½ lb. of 40 per cent. straight nitroglycerin dynamite, was tamped with 1 lb. of dry fireclay. This was fired from a cannon in the end of a long gallery in the presence of bituminous-coal dust 100-mesh fine. The explosion resulting was not severe and was evidently due to the powder only and entirely unaided by the ignition of the coal dust.

THE COAL-DUST EXPLOSION RESULTING FROM THE USE OF BLACK BLASTING POWDER

was followed for a long time by a heavy smoke, which also poured from the safety valves along the top. The picture gives a vivid representation of the large quantities of smoke formed and no one could doubt that the coal dust had done its part in producing the loud detonation, the livid flames and the great clouds of smoke, so unlike that formed by powder.

MINE-RESCUE WORK

Meantime the first-aid teams were working off their ties and the mine-rescue teams were being examined and put through their drill. Rescue teams are numerous in Indiana. The full list of the competing teams will prove that; there were 11 in all of these, yet only one came from outside the state.

The list follows: Superior Coal Co., Gillespie, Ill.; Vandalia Coal Co. No. 82, Terre Haute, Ind.; Knox Coal & Mining Co., Bicknell, Ind.; J. Wooley Coal Co., Paxton, Ind. (two teams); Bunsen Coal Co., Brazil, Ind.; Clinton Coal Co., Crown Hill team, Clinton, Ind.; Vandalia Coal Co. No. 69, Terre Haute, Ind.; Vandalia Coal Co. No. 20, Linton, Ind.; Vandalia Coal Co. No. 9, Linton, Ind., and Vandalia Coal Co. No. 10, Dugger, Ind.

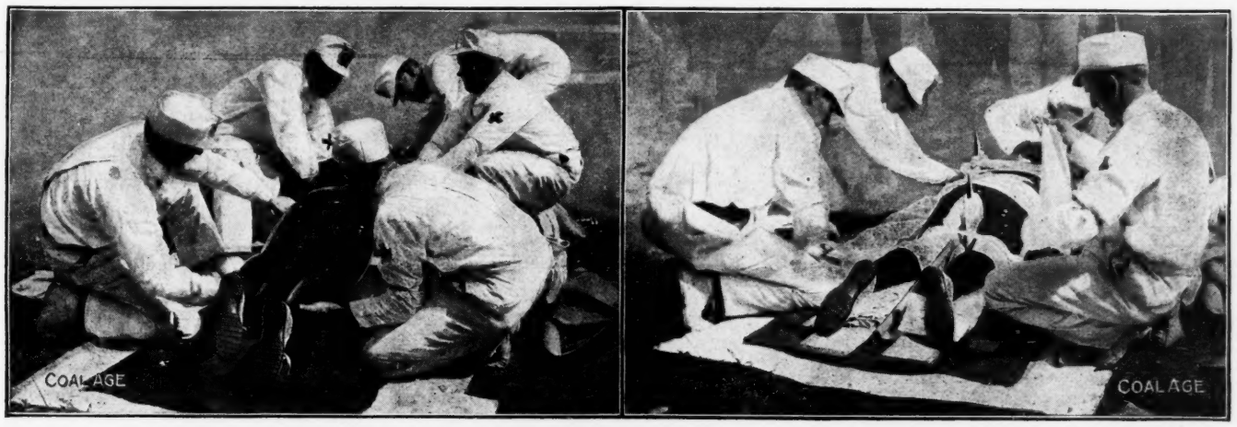
THE SMOKER AND AWARD OF PRIZES

In the evening, a smoker was held in the banquet hall of the Terre Haute House, at which all the teams and guests were present. H. M. Wilson was toastmaster. The speakers consisted of Donn M. Roberts, the Mayor of Terre Haute, who delivered the address of welcome; John P. Reese, the past president of the association; William Houston, president of United Mine Workers Union, No. 11; Edgar A. Perkins, chief of the Indiana mine inspectors' bureau; Carl Sholz, president of the American Mining Congress, and Dr. A. F. Knoefel, the incoming president. William Houston declared that the union should back safety and first-aid work with the utmost vigor and declared that he believed that the existence of unions promoted safety.

Dr. Knoefel presented the prizes. The list is extremely lengthy and must necessarily be abbreviated. The special resuscitation prize, a silver cup donated by S. F. Hayward & Co., was presented to the Penn-Mary Coal Co., of Heilwood, Penn., for the second time, and now becomes their permanent property.

The team consists of J. Fleming, captain; T. E. Engle, subject; Harry Davis, John Stone, Gottlieb Stone and William Stout.

The team scoring the highest general average was that of the Bunsen Coal Co., Westville, Ill. The names of the members of the team are: John Krainok, captain; C. Newman, subject; J. De Barker, Steve Shaffer, Charles Elliott and



PENN-MARY TEAM OPERATING ON MAN WITH BROKEN BACK

Transferring patient onto long splints

Securing picks between the legs and under armpits

Stull Boots. As a reward, they received $100 donated by the Indiana Coal Operators' Reciprocal Organization, Terre Haute, Ind. Also, the Colliery Engineer Challenge Cup, which now passes from the Penn-Mary Coal Co. team, which held it last year. Each member of the team received American Red Cross bronze medals and American Mine Safety Association silver medals.

The Penn-Mary Coal Co., of Heilwood, Penn., received second place and were presented with a Burroughs-Welcome Tabloid First-Aid Case, American Mine Safety Association bronze medals and American Red Cross certificates.

The team of the J. K. Dering Coal Co., Oak Hill mine, Clinton, Ind., secured third place, receiving American Red Cross certificates and medals donated by the Indiana Operators' Reciprocal Organization.

The following teams secured fourth, fifth, sixth, seventh, eighth, ninth, 10th, 11th, 12th and 13th places, respectively, and received medals donated by the Indiana Coal Operators: Vandalia Coal Co., No. 9 mine, Linton, Ind.; Clinton Coal Co., Clinton, Ind.; Superior Coal Co. No. 2, Gillespie, Ill.; Superior Coal Co. No. 1, Gillespie, Ill.; Calora Coal Co., Jasonville, Ind.; Superior Coal Co. No. 3, Gillespie, Ill.; Vandalia Coal Co., No. 82 mine, Terre Haute, Ind.; Cambria Steel Co., Johnstown, Penn.; Bunsen Coal Co., Universal, Ind., and J. Wooley Coal Co. No. 1, Paxton, Ind.

Prizes were also given to the following, who obtained places in the order named: Vandalia Coal Co., Mine No. 10, No. 1 team; O'Gara Coal Co., Harrisburg, Ill.; Monon Coal Co., Cana, Ind.; Vandalia Coal Co. No. 20, Linton, Ind.; Indian Creek Coal & Mining Co., Bicknell, Ind.; Sugar Valley Coal Co., West Terre Haute, Ind., and Knox Coal & Mining Co., Bicknell, Ind. The prizes awarded were of a miscellaneous character, including Hirsch and Wico electric safety lamps, an electric coffee percolator, a Johnson & Johnson first-aid cabinet, a carafe and several bottles of liquid soap.

PRIZE FOR EFFICIENCY IN IMPROVISING DRESSINGS

The Calora Coal Co., of Jasonville, Ind., received a special prize for proficiency in improvising material and dressings. Each of the teams received a Baldwin acetylene lamp. The team scoring the highest number of points in the one-man event was that of the O'Gara Coal Co., No .1 mine, Harrisburg, Ill. The team received a Westinghouse electric fan and two bicycle tires.

The Penn-Mary Coal Co., Heilwood, Penn., received subscriptions to some engineering papers in recognition of its supremacy in the two-man event.

The Colliery Engineer Challenge Cup was won by the mine-rescue team of the J. K. Dering Coal Co., of Clinton, Ind. The members of the team are: Scott Amour, captain; Matthew Kerr, George Waters, George Wilson and Stanley Howell. The other contestants scored as follows: (2) J. Wooley Coal Co. No. 1, Paxton, Ind.; (3) J. Wooley Coal Co. No. 3, Paxton, Ind.; (4) Superior Coal Co., Gillespie, Ill.; (5) Bunsen Coal Co., Universal, Ind.; (6) Vandalia Coal Co., Terre Haute, Ind. The winners of second place received medals from the Indiana Coal Operators, a Koehler aluminum safety lamp, an American safety lamp and other prizes.

The smoker was followed by a vaudeville performance and some moving pictures, including a presentation of the first safety meeting in 1911 and some scenes in the interior of the United States Coal & Coke Co.'s mines in Gary, W. Va.

THE PENN-MARY AND MONON COAL COS.' DRESSINGS FOR BROKEN BACK

The recorders for the first-aid contests were D. M. Duncan and T. S. Martin, both of Terre Haute and E. C. Lee, Harrisburg, Ill. The recorders of the mine-rescue events were E. C. Lee, J. T. More, Denver, Colo., and A. I. Young, Pittsburgh, Penn. Among the judges was Dr. Tuthill of the Copper Queen Consolidated of Morenci, Ariz.

On Monday, Sept. 14, there was a practical exercise for all the mine-rescue teams at the mine of the Glen Ayr Coal Co. This mine had been closed for some time and was full of blackdamp. As a result of the helmet work and other care taken, no one was affected by the operations in the mine except Dr. A. F. Knoefel, who was nearly drowned in the sump.

The Susquehanna Meet

SYNOPSIS—At the Susquehanna meet all the contestants solved the same problems. The awards were not based on average efficiency, but prizes were given for the first and second-best team in each event. A safety exhibit and a breaker boys' team were important new features.

This year the Susquehanna and Lytle Coal Cos. have 44 teams enrolled as against 42 a year ago, and the enthusiasm for first-aid work has increased rather than diminished. In making his speech Morris Williams, the president, referred with pleasure to this growing interest, which was really not expected by anyone. A few years ago everyone predicted that the interest was one which would pass like a fad.

But, as a matter of fact, the study of first-aid is continually growing, not only in new places, but at its point of origin in the United States—the anthracite region. The study is expected to invade the schools shortly, and the children will enter the mines endoctrinated with safety notions and prepared to render first-aid. Then the whole attitude of the mining population will change for the better. In fact, as Mr. Williams declared, to doubt that the movement will grow and spread is to question the humanitarianism of the miners and operators, and is not creditable to those who indulge in such pessimism.

The contest, which was held on Saturday, Sept. 26, was the fifth of the series. It was held as before at Edgewood Park near Shamokin, Penn., special trains being run to carry the men to that point. The judges were Dr. J. B. Rogers, of Pottsville, Dr. D. H. Lake, of Kingston and Dr. James W. Geist, of Wilkes-Barre. The surgeons of the company were in charge, but they had nothing to do with the judging. They are Drs. J. M. Maurer, G. M Stites, B. C. Guldin and J. H. Hughes.

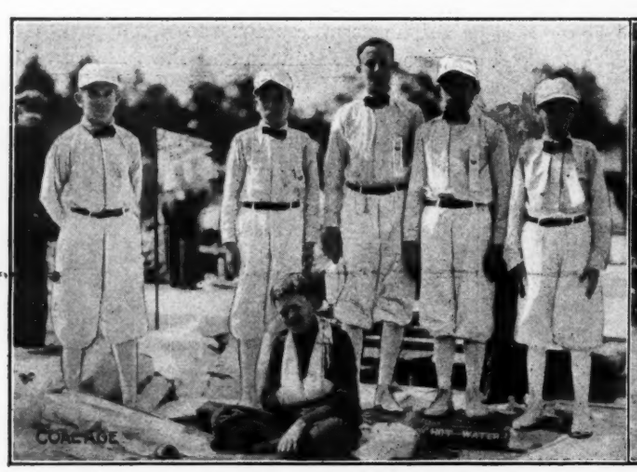
It may be pointed out that all the three judges examined the work in every event when completed. Each made a separate estimation of the award due to each team, and the averages of these were credited to the various teams. In this way, the utmost care was taken to evaluate the character of the completed work.

Safety Exhibit at the Susquehanna Meet

Breaker Boys in Two-Man Event

Improvement in Work Manifest

Perhaps this method does not invite such a scrupulous attention to the care of the patient. The end is apt to be kept in view rather than the means. But it is said that the training of the last year has improved the men immensely in this particular, and the litter work showed a great improvement. Some teams, however—a few only be it noted—carried their litters nonchalantly, and a box of tools would have been better carried by such bearers than an injured man. For the most part, however, the first-aid men broke step and walked slowly, and the rhythmic movement of the springs was not in general visible to the eye of a spectator in the grandstand. The bandaging appeared more than usually good.



Breaker-Boy Team

Spread under the Trees

THE EVENTS IN DETAIL

The first event for one man only was as follows: Sprain of left ankle. Make a one-man rescue and carry to station (wrist carry). Dress with short splints. Time, 6 min.

The first prize in this event went to No. 1 and No. 5 slopes of the Pennsylvania Colliery, Mt. Carmel. The teams comprised the following: William Matthews, captain, motorman; Robert Kendtner, pumpman; Andrew Saduskie, footman; Andrew Zigray, footman; Felix Fifer, driver, and Albert Evans, subject, motor conductor. The second prize went to the team of No. 6 tunnel, Colliery No. 6, Glen Lyon.

The second event was for two men only and ran as follows: "Man found unconscious on road with right hand in contact with electric wire. Rescue, revive with artificial respiration by Sylvester method. Dress burn on hand. Carry 10 ft. with four-handed seat."

The first prize in this event was also secured by the efficient team from No. 1 and No. 5 slopes of the Pennsylvania Colliery, Mt. Carmel, Penn. The second prize fell to No. 4 slope of Colliery No. 5, Nanticoke, Penn.

The third event was for three men. The patient had a simple fracture of the right knee cap, a lacerated wound of the left shin bone and a fracture of the fifth and sixth ribs on the right side. The bandaging of the team of No. 2 shaft of Colliery No. 5, Nanticoke, Penn., was awarded the first prize. The team consists of the following members: Ernest Bleith, captain, shoer; John Wadzinski, timekeeper; David Edwards, driver-boss; Frank Riefski, head runner; Arthur Gething, timekeeper, and Michael Weiss, subject, runner. The next best team was that of the outside men of Richards Colliery, Mt. Carmel, Penn.

The full team event required the bandaging of a broken jawbone, of a fracture of the left collar bone and of a compound fracture of the right arm and a fracture of the pelvis.

The winners of this, the principal event, were the No. 1 team of Williamstown. The men comprising that team are as follows: Joseph Llewellyn, captain, footman; James Byerly, breaker boss; William Smith, fireboss; H. Troutman, machinist; John Gittings, inside timekeeper, and Felix Samuels, subject, breaker clerk.

The second prize for the full-team event was awarded to the Richards Colliery, outside team, Mt. Carmel, Penn. As they also secured a second prize and distinguished themselves in this, the main event, we give their names: D. P. Burke, captain, breaker machinist; Jacob Hollister, fireboss; Charles Dietz, carpenter; Ralph Bickel, blacksmith helper; Herold Brokenshire, timberman, and George O'Donnell, subject, machinist helper.

The winners in the first three events received French bronze medals while those who won in the full-team event obtaining first prize were awarded a silver cup and medals of gold bronze. A silver medal was given, in recognition of his able directorship, to Dr. G. M. Stites, who trained the team.

The prizes were handed to the winners by nurses from the State Hospital at Shamokin. They were interested spectators of the events throughout the day. Reference is made in our editorial columns this week to the speeches delivered after the presentation of prizes.

AN EXHIBIT OF SAFETY METHODS

The exhibition of safety methods at the gate was extremely interesting and attracted much attention. It is a pleasing addition to first-aid meets, for however desirable first-aid may be, safety always stands one notch higher, as prevention is always better than cure. It is perhaps not so easy to exhibit these strivings for safety as it is to demonstrate first-aid work, but whatever can be done should be attempted. The pay statements which were exhibited with safety maxims printed across their faces are valuable aids to safety, especially seeing that the Susquehanna Coal Co. changes these maxims on the occasion of every pay, so that new admonitions are continually presented.

The Meet of the Philadelphia & Reading Coal & Iron Co.

SYNOPSIS—The methods of conducting the Reading meet are different from those pursued by most other companies. Their roller-bandage work is marvelous and the labors of the first-aid corps together with certain preventive measures have reduced accidents markedly.

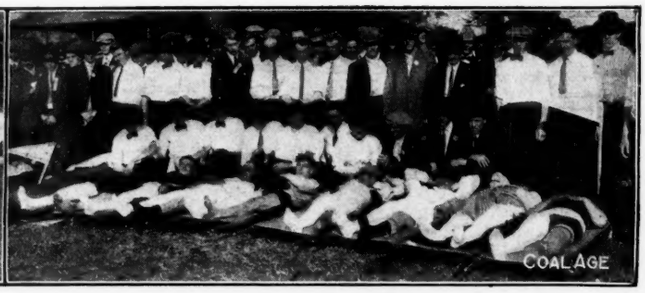
The Reading company meet is always regarded as one of the leading events in the anthracite region and the roller-bandage work done by the teams of the company is conceded to have no equal. One of the interesting features is that the teams of each district draw numbers in the elimination contest, and according to these drawings they are set to perform some one of a series of problems.

Those who perform these with due skill enter the final contest which is a single problem, announced beforehand, and the same for all teams. The work done in this final event is therefore merely a test of skill for it may be assumed at once that every team entering will have the necessary *knowledge* to enable it to earn 100 per cent. from the judges.

This year the winner was the team of the Draper Colliery. Everyone regarded the Wadesville dressing with

THE TEAMS WHICH, IN PROBLEM 2, TREATED THEIR PATIENTS FOR COMPOUND FRACTURE OF JAW AND LACERATION OF RIGHT EAR

TREATMENT FOR DISLOCATION OF KNEE, LACERATION OF THIGH AND SEVERE HEMORRHAGE



CONTESTANTS IN FINAL, AND ROLLER BANDAGES FOR WHICH THE READING TEAMS ARE FAMOUS

much favor and perhaps it appealed also to the judges but doubtless the ruling on the program weighed in the result and the Wadesville team had violated it. This admonition runs: "The dressing of all injuries is to be done with material issued for the purpose."

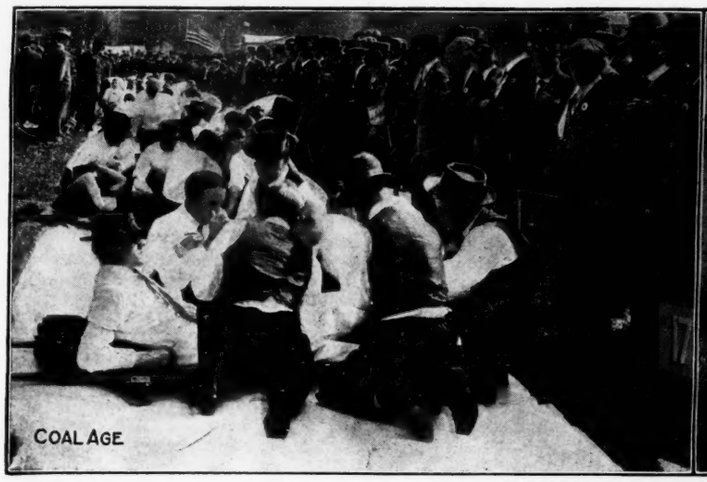
THE PROBLEMS PRESENTED

The meet was held at Lakeside Park, East Mahanoy Junction as usual and on Saturday, Sept. 19. The corps of each district drew one of the following 10 problems:

1. Handling by one, two and three and litter. Cross-obstruction and load ambulance. Time allowance, 12 min.
2. Compound fracture of jaw. Laceration of right ear. Two 2-in. bandages. Time allowance, 5 min.
3. Compound fracture of right forearm. Simple fracture of left forearm. (Dress arms at same time.) Five 2½-in. bandages; one torniquet; three pieces of gauze; two triangular bandages. Time allowance, 10 min.
4. Dislocation of knee. Laceration of thigh with severe hemorrhage. (Opposite sides.) Six 2½-in. bandages; two gauze compresses; one torniquet. Time allowance, 6 min.
5. Artificial respiration, Shaffer and Sylvester methods. Use of oxygen trunk, inhalator and pulmotor. Time allowance, 10 min.
6. Burns. Left forearm, arm, head and face. Four 2½-in. bandages; six gauze squares. Time allowance, 8 min.
7. Dislocation of elbow, with laceration of fingers. Four 18-in. splints; four pieces of gauze; four 1-in. bandages; two 2½-in. bandages; two triangular bandages; one torniquet. (Dress both injuries at same time.) Time allowance, 15 min.
8. Rescue from electrical contact. Patient unconscious. Examine for injuries. (Dress one injury.) One 2½-in. bandage; one piece of gauze. Time allowance, 6 min.
9. Heat exhaustion. Falls, fractures skull. Resuscitate and dress fracture. Two gauze bandages; one piece of gauze. Time allowance, 6 min.

THE TEAMS COMPETING IN PROBLEM 6, IN WHICH THE SUBJECT IS BURNED ON LEFT FOREARM, ARM, HEAD AND FACE

THESE TEAMS DEMONSTRATED HOW TO TREAT A MAN EXHAUSTED BY HEAT, WHO HAS FALLEN AND BROKEN HIS SKULL



VIEW OF THE FIELD IN THE FINAL. BANDAGING FOOT, KNEE, LEG, THIGH AND HIP

WINNING TEAM FROM DRAPER COLLIERY AND BANDAGE AWARDED FIRST PRIZE

10. Fracture of spinal column, and dislocation of shoulder. Nine 4-in. bandages; two 3-in. splints; one blanket. Time allowance, 6 min.

After the contest it was ascertained the scores were as follows: Tunnel Ridge, 97 per cent.; Turkey Run, No. 1, Inside, 96 per cent.; Potts, Inside, Primrose Slope, 96 per cent.; Lincoln, 95½ per cent.; Maple Hill, Inside, 95 per cent.; Draper, Outside, 95 per cent.; Otto, 95 per cent.; Alaska, 94 per cent.; Wadesville, 93 per cent. and Bear Valley, Inside, 93 per cent.

THE EXCELLENT DEPORTMENT AT FIRST-AID MEETS

The company had sent to the field over night a trainload of colored waiters and cooks and a sumptuous repast had been prepared. It was creditable to the assembled crowd that the caterers had not hesitated to provide the best of equipment and their judgment was well founded. Such dishes as were used on the table would not have been furnished in any but the best of hotels. In fact, not only the Reading meet but all those in the anthracite region are marked by the excellent deportment of the participants. There are none of the unfortunate incidents which occasionally slightly mar the banquet sessions of some of our mining associations, where managers, foremen, engineers and salesmen constitute the personnel.

In the afternoon, the final problem was performed, with the result that Draper colliery received 98 per cent. So close was the decision that five additional physicians were called into consultation with Dr. T. C. Fegley, of Tremont, Penn., and Drs. A. J. Baur and L. M. Knauber, of Wilkes-Barre, Penn.

IMPROVEMENT IN SAFETY

The pennants and prize ribbons were presented by Miss Lorraine Richards, Miss Majorie Koch, Miss Hazel Quinlan, Miss Eleanor Powers, Miss Frances Mortimer and Miss Helen Richards. After the awards were announced, Judge Richard H. Koch, of Pottsville, congratulated the winners in a short speech and read a letter from James E. Roderick, the chief mine inspector to the president, W. J. Richards. Mr. Roderick stated that in the first six months of 1913, the accidents inside the Reading mines were 47 in number as against 21 in the same period in 1914. Outside the mines there were 11 accidents in the first half of 1913 and 4 in 1914. Thus the improvement was 55 per cent. underground and 64 per cent. on the surface or 57 per cent. as an average. Much of this improvement, the judge said, must be ascribed to first-aid work.

The importance of the meet can be judged from the fact that 77 teams comprising 503 men were entered in the contest. About 1600 people were on the field and three bands lightened the business-like character of the occasion. There was a small exhibition of mine-rescue work in a smoke room and in the test probably a half-dozen men took part. The Reading has 1740 men trained to wear mine-rescue helmets.

Next Annual Meeting of the American Mining Congress

The seventeenth annual session of the American Mining Congress will be held at Phoenix, Ariz., Dec. 7, 8, 9, 10 and 11, 1914.

The same plan will be followed as that of last year; namely, all the leading papers will be printed and distributed in advance of the convention. This plan gives better opportunity for direct discussion of the papers presented and facilitates reaching intelligent conclusions. The printed pages will be distributed to members and the author given ten minutes to make any desirable supplementary statement. Two or three speakers will be asked to make ten-minute addresses and then the discussion will be open to all delegates.

Among the subjects which will be discussed are the following: Western Mining Conditions, Mine Manufacturing, Mining Investments, Safety, Federal Aid in Mining, Federal Aid to Mining Schools, Water Power Development, Conservation, Workmen's Compensation, Development of Minerals in Reservations, Rights-of-Way on the Public Domain, Mine Taxation, Revision of Mining Laws and Compulsory Arbitration.

While the entertainment features will be so planned as not to interfere with the work of the convention, more time than usual will be allowed from the regular sessions. The local entertainment committee will be ready to make enjoyable every minute not occupied by the business of the Congress. President, Carl Scholz; Secretary, J. F. Callbreath.

The Muckle Cup Contest

SPECIAL CORRESPONDENCE

First-aid corps from 18 of the collieries in the Wyoming and Lackawanna Valleys gathered at Valley View Park, near Wilkes-Barre, on Saturday, Sept. 19, to compete for the Mrs. John S. Muckle cup. This contest is conducted annually under the auspices of the American Red Cross. About 1500 people from the stretch of coal territory lying between Mayfield on the north and Nanticoke on the south attended the meet.

Each year the intercompany meet is the cause of spirited rivalry but there is always evident that spirit of fairness and that desire on the part of all the contestants to see the best team win. This year's event was no exception to the rule, and while each team took the field with the determination of carrying off the coveted trophy there was no dissension when the judges had completed their work. The various companies which had teams in the meet declared a half holiday in order that every man might avail himself of the opportunity of witnessing the teams in their annual contests.

Owing to the fact that Major R. U. Patterson has gone to Europe to render services to the injured in the great war, Dr. M. J. Shields, field agent of the American Red Cross, is now in general charge of American Red Cross work and in that capacity conducted this meet. He declared that the contest was one of the best in the history of the competition for the Muckle cup.

Four problems were given each team and the percentages of the four events were averaged and the team with the highest average was declared the winner. The first-aid teams were so carefully trained and drilled, and showed such an expert knowledge of first-aid work, that after the last event was over it was discovered that the Central colliery team of the Delaware, Lackawanna & Western R. R. Co. Coal Department, and the Lackawanna colliery team of the Temple Coal Co. were tied with a perfect average, each team having scored 100 points in each of the four events. But further proof of the proficiency of each team came when the judges announced that the lowest average made by any team in the contest was 94.

The Old Forge team of the Pennsylvania Coal Co. carried off the cup last year but while it did excellent work in this contest, its general average of 95 made it tie for thirteenth place.

In order to decide the cup winners it was necessary for the Central colliery and the Lackawanna colliery teams to work out an extra problem. The judges carefully watched their work in the final contest and rigidly marked them, but these teams displayed such a wonderful knowledge of first-aid relief that the judges debated over their standing for some time and finally decided that the Lackawanna team was entitled to a mark of 99 for the extra event and the Central team was entitled to a credit of 98½. This made the Lackawanna team the cup winners and gave the Central team second honors in the contest. Besides having possession of the cup for one year, each member of the Lackawanna team was given a Red Cross medal. The events were as follows:

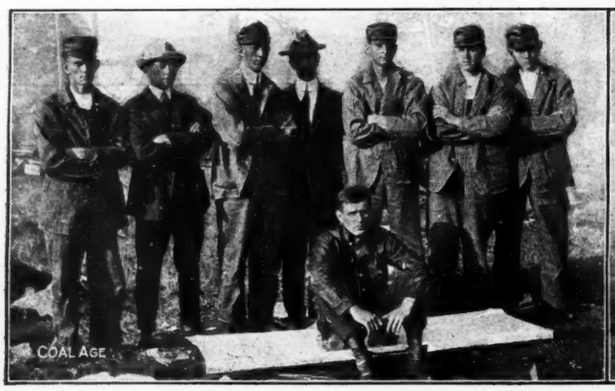
Event No. 1—For one man—Treat a lacerated wound of the forehead and a like wound of the right hand. Ten of the teams scored a perfect mark in this event.

Event No. 2—For two men—Left leg lacerated by machine bits, flesh torn loose and bone exposed but not fractured. Nine of the teams had a perfect score in this event.

Event No. 3—For four men—Fingers and left hand lacerated, bright red blood, compound fracture of right forearm. Eight teams had a perfect score in this event.

Event No. 4—For full team—Simple fracture of right thigh; fifth and sixth ribs on left side broken; compound fracture of right wrist with bright red bleeding. Five teams had perfect scores for this event.

Extra Event—For full teams of Lackawanna and Central

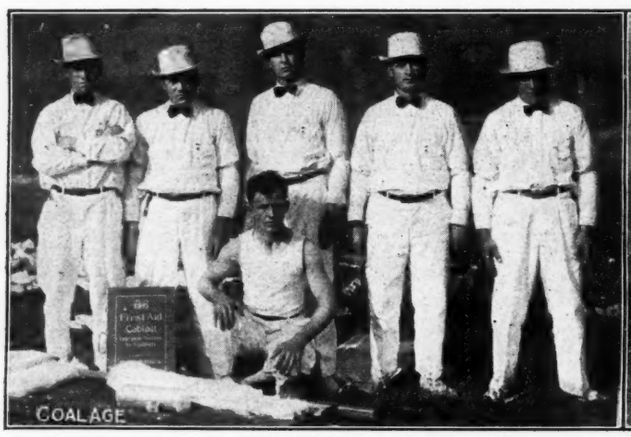


THE WINNING TEAM FROM LACKAWANNA COLLIERY

Standing from left to right: Harry Sax, captain; Leon Williams, Thomas Maggs, J. F. Rosengrant, instructor; Thomas Schultz, Harry E. Oberts, Reese Sax, and seated, Steve Wargo, subject.

THE OFFICIALS IN CHARGE OF MEET

Left to right standing: Dr. M. L. Bailey, Dr. S. S. Shields, Dr. M. J. Shields, Dr. J. A. Snyder, Dr. John B. Mason, R. I. Vail, and kneeling, Dr. J. W. Grant, Garfield Angwin and Edgar Weickel.



THE BLISS COLLIERY TEAM OF DELAWARE, LACKAWANNA & WESTERN R.R. COAL DEPARTMENT

TEAM FROM OLD FORGE COLLIERY, THE HOLDERS OF THE MUCKLE CUP IN 1913

collieries only—Man overcome by gas; rescue and apply artificial respiration for one minute; place on stretcher and carry 25 ft. The judges watched carefully every move of the teams and finally declared the Lackawanna team the winners by one half point.

The judges awarded points as follows in the different events:

Colliery	Company	No. 1	No. 2	No. 3	No. 4	Average
Lackawanna	Temple Co.	100	100	100	100	100
Central	D., L. & W.	100	100	100	100	100
Harry E.	Forty-Fort Co.	100	94	100	100	98
Pine Brook	Scranton C. Co.	98	100	100	96	98
Forty-Fort	Forty-Fort Co.	100	96	98	100	98
Mt. Lookout	Mt. Lookout Co.	100	100	100	88	97
No. 9 Breaker	Penna. Coal Co.	100	100	95	93	97
Bliss	D., L. & W.	95	98	100	95	97
Brisbin	D., L. & W.	100	100	96	94	97
Jermyn	Jermyn & Co.	100	100	90	100	97
Sterrick	Sterrick C'k Co.	93	100	95	95	96
Coray Slope	Penna. Coal Co.	100	94	94	95	96
Ewen	Penna. Coal Co.	100	94	95	95	96
Storrs	D., L. & W.	94	90	100	95	95
Mayfield	Hillside Coal Co.	95	100	94	90	95
Old Forge	Penna. Coal Co.	94	98	91	98	95
Dunmore No. 2	Penna. Coal Co.	94	92	100	90	94
Taylor	D., L. & W.	94	96	93	94	94

Mrs. John S. Muckle is a resident of Philadelphia and the cup for which the teams competed was donated in 1909 and its holders have been as follows:

CENTRAL TEAM OF THE "LACKAWANNA" CO.

1909, Avoca team of Pennsylvania Coal Co.; 1910, Woodward colliery team, Delaware, Lackawanna & Western R.R. Coal Department; 1911, Brisbin team, Delaware, Lackawanna & Western R.R. Coal Department; 1912, Pine Brook colliery, Scranton Coal Co.; 1913, Old Forge team, Pennsylvania Co.; 1914, Lackawanna colliery, Temple Coal Co.

The officials were as follows:

Judges—Doctors S. S. Shields, M. L. Bailey, J. W. Grant and J. B. Stinger. Secretaries—R. I. Vail, Edgar Weichel, J. G. Angwin. Managers—Dr. M. J. Shields, American Red Cross; C. E. Tobey, general manager, Delaware, Lackawanna & Western R.R. Coal Department; F. H. Coughlin, secretary, Pennsylvania Coal Co.

The personnel of the five best teams was as follows:

Lackawanna colliery outside—Harry Sax, captain; Thomas Maggs, Thomas Shultz, Reese Sax, Harry Oberts, Steve Wargo, subject.

Central colliery—Joshua Taylor, captain; Perry Clark, Joe Reid, Ivon Jones, Evan Davis, John Tompkins, subject.

Harry E. colliery—Isidor Horchester, captain; John Psolko, Frank Psolko, John Zinn, John Bigger, Frank Rosnick.

Pine Brook colliery—John Joyce, captain; Dennis Duffy, W. Morgan, Joshua James, Steve Slangan, Douglas Williams, subject.

Forty Fort colliery—Phillip Williams, captain; George Mathews, Frank Romanpomski, Andrew Tebush, Walter Jones, John Casnern, subject.

Charles S. Keith

Everybody interested in coal mining from Chicago to Salt Lake knows Charley Keith. It would be difficult to pick a man in any of our western fields who better typifies the mining industry of our central and Rocky Mountain country than he does. Mr. Keith is the embodiment of those qualities that tend to success in the great and difficult industry he serves. He is resourceful and a human dynamo of energy. In addition, he is possessed of a rare species of tact so necessary in the handling of thousands of men of differing race and habits.

Like many other successful men, Mr. Keith not only started at the very bottom, but planted himself in one particular spot and refused to budge either sideways or backward, only consenting to move in an ascending direction. No one who knows Mr. Keith doubts that the elevator which has carried him from the sub-basement to the palm garden on the roof was of his own manufacture and operated by motive power supplied by himself, for

CHAS. S. KEITH

himself. But best of all, and notwithstanding his rise in altitude, he has not forgotten his many old friends on the floors below and has not been spoiled by the broad view afforded him by the high elevation he has attained in the business world.

With it all Mr. Keith is still a very young man, having been born in Kansas City in January, 1873. His early education was secured in the public schools of Kansas, which preparatory training was followed by a college course at Fordham University. At this latter institution he obtained a "B. S." degree in 1891.

On leaving college, Mr. Keith immediately connected himself with the Central Coal & Coke Co., a corporation which he had already served as office boy. His rise was rapid, and is not ended yet, for each succeeding year tells a story of his greater achievements and increased influence.

Charley Keith is the type of man who is not content simply to measure up to a job, but rather the kind of fellow who makes the position fit himself. The remarkable record of growth of the Central Company is evidence of

his ability as an instrument of industrial expansion. His aim is to make his corporation not just a big concern, but the biggest of all.

Mr. Keith is rather an active citizen, and a useful member of practically all the organizations in his home town. At present, he is serving as president of the Kansas City Commercial Club; president of the Interstate Coal Operators Association and a member of the U. S. A. Chamber of Commerce. His business interests are mostly in lumber and coal. Aside from serving as president of the Central Coal & Coke Co., he is president of the Louisiana and Texas Lumber Co.; president of the Delta Lumber Co.; director of the Fidelity Trust Co. and director of the Metropolitan Street Railway Company.

In the social life of the Middle West, Mr. Keith figures prominently: He retains membership in the Kansas City Club, University Club, Midday Club, Commercial Club, Kansas City Country Club, Mission Hills Club, Blue Hills Club, Mercantile Club in St. Louis and Chicago Athletic Club.

Safety in Charging Dynamite

By H. N. Freeman*

There are many instances on record of dynamite going off with disastrous results when being inserted into the hole. This might be attributed to any one of the following causes:

1. The hole may not have been cleaned properly, and a small piece of coal remaining may break the cartridge and allow the powder to become distributed along the hole. This is liable to be and often is exploded either by forcing other cartridges into the hole and grinding the stray powder or by the friction of the tamping bar.

2. If the powder is not properly thawed, it will leave small particles of nitroglycerin on the sides of the hole, which are liable to be exploded by the friction of the tamping rod.

3. The hole may have been bored with drills that are not of the same gage. These leave a collar in the hole, so that when the powder is being inserted, it will jam against one of these collars.

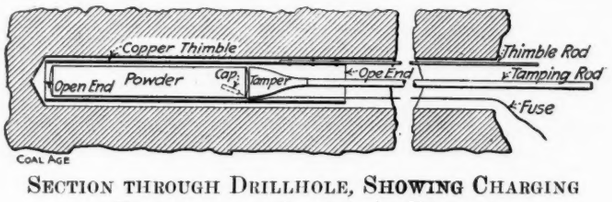
4. There is a practice prevailing among miners to force the powder, thereby causing the premature explosion of the charge.

5. It frequently happens that in his hurry a miner may neglect to put the first stick of powder to the back of the hole. He then puts in the primer and forces it on to the powder, driving the charge back a couple of inches or more. This is a common practice among miners and a large percentage of accidents may be attributable to this cause.

The accompanying figure illustrates a device that should, I think, prove a great benefit to miners in both quartz and coal. I claim it will enable one to place his powder to the back of the hole without its coming into contact with the sides of the bore.

The charger consists of a light copper tube or thimble with a rod or handle of ⅜-in. round copper riveted to the side of the tube. The thimble is made ½ in. larger in diameter than the cartridge, and ½ in. less than the diameter of the hole. A slot is made in the tube to accommodate the fuse. The charger is open at both ends, thus enabling the tamping bar to be inserted next the powder and preventing undue pressure. Both charge and tamping bar are inserted into the hole, at the same time.

After the charge has been delivered to the back of the hole, the charger is withdrawn over the tamper, and the powder is pressed into a solid mass in the back of the hole. Some miners make a practice of splitting the paper cartridge and compressing the powder to the full diameter of the hole. This can be done more safely with the charger, as the split cartridge does not come into contact with the hole, at any point, thus eliminating those causes for premature discharge to which I have previously referred.



Section through Drillhole, Showing Charging Thimble and Charge of Powder

The chargers can be made for about 10c. each; and, if properly used, are time savers in tamping a shot, all the powder being placed in the charger before it is inserted into the hole. They are especially useful when charging a hole drilled on an angle, as the full charge may be put into the hole at one time; while, otherwise, something must be used to keep one stick in place, when preparing to insert the next one.

*Manager, The Vancouver-Nanaimo Coal Mining Co., Nanaimo, B. C., Canada.

Who Knows?

He is indeed a bold prophet who pretends to forecast either the probability or improbability of future usefulness of any raw material. As has been illustrated by the radium mineral carnotite, the mineralogic curiosity of one decade may become the valuable ore of the next. Again, the principal ore of aluminum, bauxite, was not even mentioned in a list of useful minerals published by the U. S. Geological Survey 25 years ago.

Cement Gun in Coal Mines

The Bureau of Mines in February shut down its experimental mine near Bruceton after completing the second series of tests, in order to make the annual repairs and to prepare for a new series. It is expected that coal dusts from various sections of the country will be sent to the mine in order that their explosibility limit may be tested, when the dusts are admixed with shale, clay or sand. Consequently, it is necessary that part of the explosive passages of the mine should be lined to prevent dust from the roof and coal ribs from entering into the explosion tests and affecting the results.

To line the entries with massive or reinforced concrete would be beyond the pocketbook of that part of the Bureau's work, but it occurred to the chief mining engineer that as the roof and ribs to be covered were well in the interior of the mine, that if a thin coating of cement could be placed over them, sufficiently bonded to the natural strata, every purpose would be served. Accordingly a cement gun was rented, and about 750 lineal ft. in all of the entryway has been completely coated. While the tests have not yet begun, the bonding to the walls and roof, even to the draw-slate, appears even better than ex-

pected. It was especially gratifying to note that the cement mortar appears to stick tightly to the draw-slate, which is practically clay.

If a lining like this will stay permanently, it offers great possibilities in mining. The chief mining engineer thinks the gun will be of great value around any mine, as a fireproof stopping can be quickly made, and despite the rapidity of the work, the stopping will be tight and will exclude air.

The gun is arranged on wheels and is self-contained, being drawn by a small gasoline motor, except that compressed air must be furnished from outside or else a portable compressor used.

The lining will doubtless be examined by the members of the American Institute of Mining Engineers with great interest on the occasion of their visit to the experimental mine on the afternoon of Oct. 9, to witness an explosion experiment primarily to test the efficiency of various rock-dust barriers developed by the Bureau engineers.

Colorado Operators Reply to the President's Proposition

SYNOPSIS—The operators in Colorado declare that the truce proposed would be broken like the former one and assert that any concessions to disorder are derogatory to the national government whether made to corporations or to miners. They urge that, in regard to picketing, the new agreement is less satisfactory than the state law. They point out that the new commission to be appointed by the President would have far more power over the coal corporations than any of the bodies of regulation having congressional authorization.

The letter following has been addressed to the President from Denver, Colo., by a number of Colorado operators and is dated Sept. 23, 1914.

Sir: Your letter of Sept. 5 and draft of "Tentative Basis for the Adjustment of the Colorado Strike" has been submitted to us by the parties to whom it was written, at a meeting to which the operators of all the coal mines of the State were invited.

We are in complete accord with the sentiments expressed in your letter, and appreciate the interest you have taken in the "Colorado situation."

We realize that, with the multitude of more important matters constantly engrossing your time and thought, you are, to a large degree, dependent for your information concerning the Colorado strike on the representatives of the Government of the United States who, you state, "have been actively engaged in the investigation of the whole situation and in trying to reach a dispassionate conclusion."

It is to be regretted that the character of the investigation and the previous records of these representatives selected by Secretary of Labor Wilson justify the belief that they are partisans of the men who have made necessary the presence of the Federal troops in the strike district. One of the representatives, William Fairley, was a member of the National Executive Committee of the United Mine Workers of America for Alabama, and, according to their Treasurer's report, was on their payroll during the year ended Nov. 30, 1913, and was actively engaged as an organizer and agitator in the Colorado strike in 1904.

The New Truce as Easy to Violate as the Old

The utmost sought to be accomplished by the tentative plan is the establishment of a three-year "truce" presumably between the coal-mine owners of this State and the organization known as the United Mine Workers of America, which instigated and has conducted and financed the strike.

For many reasons, we deem it unwise to enter into engagements of any character with this particular labor union, especially an agreement dependent upon a cessation of armed hostilities upon its part.

The Governor of this State, some months since, entered into an agreement of truce with the leaders of this organization, and, in utter disregard of their obligations, the striking miners, under the direction of these identical leaders, continued with renewed vigor to destroy our properties and kill our workmen. It would be imprudent to again place any reliance upon the good faith of these men.

We feel, furthermore, that a mere "truce," even if it could be enforced against the voluntary, unincorporated association and its irresponsible leaders, is but a palliative measure and can lead to nothing other than what the term itself implies—a renewal of trouble at its termination.

No reference is made nor consideration given in the "tentative plan" to the large body of men, some 9500 in number, who are now peaceably at work in the mining districts of the State, who have caused no disturbance of any kind, and whose only desire is that they be permitted to continue at work without interference from any outside source. As a matter of justice their desires should be ascertained and given full consideration. It is this body which has continued industriously at work during the last year, thus saving the public from the loss and discomfort which would have resulted from a scarcity and excessive price of coal.

A Concession to Disorder

Again, the plan proposed involves, in effect, a contract or agreement between the operators and the strikers or their leaders that both will keep the peace and obey the law for the period of three years. It appears to us that the plan is subject to fair criticism in that it implies the helplessness of government to maintain law and order and secure to every citizen his constitutional rights without the consent and approval of those evilly disposed.

We believe that a large majority of the people of Colorado agree with us that the sole issue at the present time is the preservation of law and order in the strike districts and the maintenance of the constitutional right of every man to work when, where, for whom, and upon such terms as he sees fit.

It would be fatal to the preservation of government, either national or State, for either to discuss with offenders of any character the terms upon which the laws should be obeyed and acts of lawless violence be discontinued.

Whether the blame for what has taken place in Colorado is chargeable to the operators or to the striking miners and their leaders, the plan proposed involves a bargain between government and law on the one side, and violators of the law on the other.

Operators Readily Agree to Three Propositions

Not as a matter of contract or "truce" with the United Mine Workers of America or the strikers, but with a desire to meet your views so far as possible, we will adopt and coöperate in putting into effect three of the six suggestions in the "tentative plan," and the fourth with necessary, and, as we believe, reasonable modifications.

1. "Enforcement of mining and labor laws of the State."

We have not wilfully violated any of the laws of the State, and will render every possible assistance to the civil authorities in their enforcement.

3. "Intimidation of union or non-union men strictly prohibited."

We agree to this without reservation, but the "tentative plan" provides no way of enforcing the rule.

4. "Current scale of wages, rules, and regulations for each mine to be printed and posted.

This practice is already in force in many of the mines in the State, and we will at once put the suggestion into effect at all our mines.

Employment of All But the Convicted

2. That all striking miners who have not been found guilty of violation of the law shall be given employment by the employer they formerly worked for, and where the place of the employee has been filled, he shall be given employment as a miner at the same or other mines of the company."

We are and have been willing to employ as many of the strikers as possible, without discriminating against them

for having laid down their tools, and we believe that we can give work to a very large majority of those remaining in the State. But it is quite impossible for us to agree to employ all striking miners who have not been found guilty of violence. Whether those who have participated in violence are prosecuted and found guilty or not, we cannot agree to give them employment in the mines operated by us.

In six of the counties of the State 332 of the strikers, including officers of the United Mine Workers of America, are under indictment for murder and 137 for other felonies. None of them have been tried, therefore none have been found guilty, and much time may elapse before they are tried. The personal safety of our present employees and their families, to say nothing of the protection of our property, demand that we exercise the greatest possible care in employing men from the ranks of the strikers, who have been banded together to drive our employees from our mines and to destroy our property.

The coal mines of Colorado last month (August, 1914), employed approximately 9500 men, or nearly 80 per cent. of the number employed during the corresponding month of last year—the month immediately preceding the calling of the strike. The present force of men can probably produce sufficient coal to meet the requirements of the Colorado public during the coming winter, and it is certain that no shortage can occur if the orders under which the Federal troops are acting can be so modified as to permit the many idle men who apply for work to be given employment without the limitations or restrictions now enforced by the Federal troops.

Some "Strikers" Have Never Yet Mined Coal

Some of the larger companies have closed a number of their mines, and under existing business conditions they will undoubtedly remain closed for a considerable period of time.

Many of the strikers have left the State and found work elsewhere. A considerable number have returned to work at our mines from time to time, ever since the strike was called, so that of those who originally went out on strike but comparatively few remain. Many of the men now in the strikers' camps have never worked in the mines of Colorado, but have been imported by the United Mine Workers to keep up the semblance of a strike.

Grievance Committee Mischievous

5. "Each mine to have a Grievance Committee, Etc."

This is a favorite method of the United Mine Workers' organization to foment trouble and provoke strife, although they have in many cases, notably in West Virginia, waived this demand.

In practice, it has been found that such committees have a damaging effect on the interests of both the employee and employer. The tendency of such committees is to magnify trifling and unjust complaints into great grievances, and interfere with the discipline necessary for the safety of the employees and company property, and to destroy the authority of the officers responsible for the operation of the mines.

Our employees have never asked for such a committee and we are strongly opposed to this feature of the "tentative plan."

We have always listened to and have been ready to correct any substantial grievances of our employees. There are surprisingly few complaints, except in times of strike, and such complaints are principally after-thoughts of the strikers. But to remove every possible cause for criticism we have been for some time and are now working on a plan (which we had taken up with the Governor prior to the receipt of your letter) to protect our employees against any possible injustice on the part of mine bosses, and to investigate and correct real or dissipate imaginary grievances, if any such exist. This plan, we believe, will satisfy our employees without destroying the necessary authority or influence of our superintendents and without depriving us of the reasonable control of our business.

A Commission with Unequaled Powers

Clauses five and six provide for a commission which "shall serve as adjusters or referees in all disputes (whether individual or collective) affecting wages, working and social conditions." "The decisions of the commission shall be final and binding on employers and employees." "Willful violation of any of these conditions will be subject to such penalties as may be imposed by the commission."

The unlimited authority of this proposed commission of three persons to be appointed by the President of the United States practically puts the entire control of the most important department of our business in its hands. Its power to control the conduct of our business far exceeds any of the demands of the United Mine Workers of America. A commission with such powers has never before, to our knowledge, existed or been suggested. The Interstate Commerce Commission, with all of its extensive powers for the regulation of railroads and railroad business, has no such variety or scope of authority as this proposed commission, while the decisions of the Interstate Commerce Commission are subject to review by the courts under established rules of law.

The power to regulate the wages of our employees individually and collectively, as often as demands are made, would prevent us from making any estimate of the cost of production on which to base our contracts for the sale of coal, and could be used to destroy existing competitive conditions.

The power to adjust all questions affecting working conditions will destroy the discipline necessary for the safety not only of the men but of the property.

The power to regulate social conditions would destroy the personal liberty of individuals, and is a more sweeping and comprehensive control than is claimed by either Church or State.

The decisions of this commission could not be enforced against our employees, who, if dissatisfied with the award, could leave our employ and seek work elsewhere, whereas, to the extent of our financial responsibility, the award could be enforced against us.

An unwise or unjust exercise of the powers of this commission might result in the financial ruin of any operator.

It is unfair to place our business in a position where it can, under any circumstance, be subjected to the unappealable mandates of any men or body of men however well meaning and experienced.

Operators to Agree to a Violation of State Laws

We regret our inability to agree to this suggestion of the "tentative plan."

6. Paragraph "D." "There shall be no picketing, parading, colonizing, or mass campaigning of representatives of any labor organization of miners who are parties to this truce, which will interfere with the working operations of any mine.

How the Former Truce Was Observed at the McNally Mine on Apr. 27, 1914

House at Piedmont of Rocky Mountain Fuel Co., Blown Up by Strikers, Nov. 11, 1913

Picketing is prohibited by State law, and that law can be enforced by the civil authorities. The limitations placed on the observance of this rule, as above emphasized, could be made a pretext for its constant violation.

Paragraph "G." "The suspension of a mine over six consecutive days by the company may be authorized for a cause satisfactory to the commission, but not pending any dispute."

This rule totally disregards possible market conditions and other industrial contingencies, which, in the ordinary course of the business, frequently make it necessary to suspend operations for considerable periods of time—under some conditions for a month or even longer.

The Involuntary Check-Off

"On account of the mutual benefits derived from the 'truce,' employers and employees should each pay one-half of the expenses of the commission."

Our present employees, who have not been considered in the "tentative plan," should not be asked to contribute to the maintenance of such a commission. Neither do we see how we as operators can agree that our employees will contribute to this expense except by their individual consent.

Necessity for Federal Troops

It is not our purpose to take up your time with a history of the strike and the circumstances leading up to it, nor to discuss whether the operators or strikers were responsible for the past violence, but we wish to call your attention to the fact that since you sent the Federal troops into the strike districts there has been nothing in the attitude of the coal operators to make the presence of the troops necessary, and, except for the attitude of the strikers, the Federal troops could be withdrawn at any time without endangering the peace of the district or the safety of the strikers.

On the arrival of the Federal troops in the State, the coal operators promptly complied with your proclamation by delivering up all of their arms and dismissing their guards.

On the contrary, the strikers defied your authority, gave up only a few of their arms and still gathered together in camps with arms readily available for the purpose of attacking our mines as soon as the Federal troops are withdrawn.

Our employees being now unarmed and our property defenseless, if the Federal troops are withdrawn, great destruction of life and property will surely occur.

Suggestions for Creating Peace

We respectfully suggest that the Federal troops can safely be withdrawn from Colorado when the officers and agents of the United Mine Workers of America cease to incite the strikers to lawlessness and cease to support them in idleness; or when the strikers surrender their arms and ammunition and the Governor of the State puts into effect by proclamation and enforces the law passed at the special session of the State Legislature held last May relating to the shipment, sale, and possession of arms and ammunition in the strike districts.

We shall be glad to coöperate with you in any practical measures having for their object the termination of the unfortunate labor conditions which, to some extent, still exist in this State. It is our firm conviction that the result universally desired can be obtained by a strict and impartial enforcement of the laws affecting alike strikers and operators. To this end, we take the liberty of suggesting that there be such concurrent action upon the part of the Federal and State authorities as will enable the Governor to immediately put into effect, within the limits of the disturbed district, by proclamation, the laws recently enacted by this State relating to the sale and possession of arms and ammunition, and to repeat our frequent requests that the orders to the officers in command of the Federal troops in this State restricting the mine operators in the employment of labor be so modified as to permit the employment of workmen as in normal times. Respectfully,

VICTOR-AMERICAN FUEL CO., J. C. Osgood, Chairman.
ROCKY MOUNTAIN FUEL CO., D. W. Brown, President.
BROOKS-HARRISON FUEL CO., James E. Brooks, President.
PALISADE COAL AND SUPPLY CO., Henry Denman.
PRIMROSE COAL CO., H. B. King, President.
NATIONAL FUEL CO., H. Van Mater, President.
ROYAL FUEL CO., H. Van Mater, President.
GORDON COAL CO., Wm. Dick, President.
NEW MAITLAND COAL CO., J. T. Thompson, President.
WILLIAMSBURG COAL CO., Simon P. Smith, President.
ROYAL GORGE COAL AND FIRECLAY CO., E. G. Bettis, President.
EMPIRE COAL MINING CO., R. D. Marthens, Treasurer.
BIG FOUR COAL AND COKE CO., P. M. Peltier, President.
HAYDEN BROS. COAL CORPORATION, Lewis A. Hayden, President.
GARFIELD MINE LEASING CO., E. Horstman, President.
CONSOLIDATED COAL AND COKE CO., C. L. Baum, President.
ALLIANCE COAL CO., D. A. Cannon, President.
CEDAR HILL COAL AND COKE CO., D. M. Harrington, President.
PATTERSON & SONS COAL CO., El Paso Co., Alex. Patterson.
PIKE'S PEAK FUEL CO., John Tait Milliken.
SANTA FE COAL CO., S. S. Murphey, President.
TURNER COAL CO., James B. Dick, President.
RUGBY FUEL CO., George D. Kimball, General Manager.
WALSENBURG COAL MINING CO., George Fruth, President
BALDWIN FUEL CO., H. E. McElwain, President.
BREEN COAL CO., J. P. Breen.
AZTEC COAL MINING CO., J. S. Autrey, President.
YAMPA VALLEY COAL CO., P. M. Peltier, President.
FREDERICK FUEL CO., D. M. Simpson, President.
ROUTT COUNTY FUEL CO., E. L. Prentiss, President.
CHICOSA FUEL CO., J. V. Sickman, President.
UNION COAL AND COKE CO., Jas. V. Bowen, President.
HUERFANO COAL CO., S. S. Murphey, President.
SUNNYSIDE COAL MINING CO., W. F. Oakes, President.
SOUTH CAÑON COAL CO., H. F. Nash, General Manager.
OAKDALE COAL CO., William B. Lewis, President.
MUTUAL COAL CO., S. S. Murphey, President.
TEMPLE FUEL CO., F. R. Wood, President.
NORTHERN COLORADO COAL CO., J. S. Siple, General Manager.
GRAND JUNCTION MINING AND FUEL CO., H. M. McNeil, Secretary and Treasurer.
NEW FOX COAL CO., D. E. Evans, President.
MOFFAT COAL CO., S. M. Perry, President.
LEYDEN COAL CO., S. M. Perry, President.

The undersigned operators, who have made agreements with the United Mine Workers of America and are employing union labor, join in the views expressed in the foregoing letter in relation to the "tentative plan" therein referred to:

RAPSON COAL MINING CO., W. W. Curtis, President.
CARBONADO COAL MINING CO., J. B. Hutchinson, President.
MINNEQUA COAL CO., E. F. McGowan, President.
P. K. HARMON.
BLACK CAÑON FUEL CO., Talton F. Crane, Secretary.

Don'ts for Rescue Corps

Note—From book of instructions of Susquehanna Coal Co., Wilkes-Barre, Penn.

1. Don't fail to notify the man in charge of apparatus at once in case of trouble.
2. Don't tamper with the apparatus. It is ready for service.
3. Don't use old batteries in your lamp.
4. Don't hurry when using the apparatus.
5. Don't put the apparatus on alone and go into the danger zone without having someone make a thorough inspection of the apparatus. Don't go into the danger zone alone.
6. Don't use old cartridges in dangerous work.
7. Don't fail to look at pressure gage before going into the danger zone.
8. Don't fail to inspect all connections before putting the apparatus on.
9. Don't fail to keep in communication with the other helmet men.
10. Don't take helmet off in danger zone.
11. Don't forget that the rescue of men is the first consideration.
12. Don't forget to send for the first-aid immediately.
13. Don't chew tobacco in the helmet.
14. Don't disturb too much wreckage on first inspection It might start something.
15. Don't fail to note conditions.
16. Don't fail to report conditions noted.
17. Don't fail to report any abnormal behavior of the apparatus.
18. Don't forget to return immediately if you think apparatus is not working properly.
19. Don't take chances—PLAY SAFE.
20. Don't fail to follow instructions.
21. Don't go into a strange mine without a guide.
22. Don't expect to be able to work as hard or as fast with the apparatus on as without it. You are carrying a load.
23. Don't, under any consideration, when exploring a mine in which electricity is used, get in contact with bare wires, unless you are sure the current is off.
24. Don't fail to take extra electric lamps with you from the rescue station—some may not work properly.
25. Don't forget the apparatus is only good for two hours.

Editorials

Buy a Bale!

The cotton growers say, "Let every one buy a bale of cotton so as to enable the cotton farmers to go on raising crops during the war." And it is an extremely popular movement, but it will probably result in a glut of cotton and if no one buys the crop, the land next year will be devoted to something else and serve an almost equally useful purpose.

But if the war causes bad times and the demand for coal becomes slack as is likely to happen, will everybody buy a dozen tons of coal so as to keep the miners busy who otherwise would be idle? Is not their idle labor as much an economic loss as the cotton farmers' idle land, if it really becomes idle? Is their lack of wherewithal any less distressing than that of the cotton growers? Is there, in short, anything more logical in "Buy a bale" than in "Buy a cellar-full of coal?"

We think not, but we are not surprised at the argument in the opposing direction; for our care of the farmer has exceeded our care for any industry except in the matter of tariff. In that one direction of glaring discrimination, we have more than made up for all our false sentiment and tender solicitude for the farmer.

Compensation in Pennsylvania

The Susquehanna Coal Co., with its affiliations, mines about 5½ million tons of coal per year. It has perhaps as large a number of first-aid teams per thousand of tons of production as any company in the anthracite region, and we might add in United States, for the first-aid teams in the hard-coal mines are easily leaders in numbers and efficiency. At the recent meet at Shamokin, the Susquehanna had 44 teams in the field.

The recent contest at Terre Haute, Ind., was considered by everyone a marvelous success, yet only 29 teams competed. There is no question about the energy with which the Susquehanna employees, with Morris Williams and Robert Quinn at their head, are striving for safety.

Last year the company spent $50,000 for safety inspectors alone, and there is evidence that the expenditure was not without its reward in the saving of life and limb. A year ago the address of the president of the company, Morris Williams, was on the introduction of safety inspection. This year his talk was mainly on compensation for injuries.

He stated that a prominent coal operator had remarked to him that it was a conscienceless nation which would send its men into the battle and not provide for the widows and orphans and it was an industry without shame which would send its men into danger and not protect, by compensation, the dependents of those who might be killed at their daily task. Mr. Williams believed that a compensation bill should be passed at once which would protect the wives of miners and others from the prospect of closing their lives over the steam of a washtub.

A few years from now, such remarks will be merest platitude, so fast do we move forward. But today, Mr. Williams' remark is regarded as a bold statement. We trust that many other operators will support Morris Williams in his stand for workmen's compensation. In this connection, it is interesting to note that in 1912, at the summer meeting of the Coal Mining Institute of America, H. S. Endsley, counsel for the Cambria Steel Co., also advocated this provision.

It is true that in many other states, operators have come forward and prepared compensation bills, but in most cases they were face to face with conditions which threatened to bankrupt the companies. Unreasonable juries were bringing in verdicts unfair to the coal corporations and which threatened to drive them out of business. Any compensation bill was an improvement on the conditions existing.

But in Pennsylvania, a compensation enactment will replace a condition whereby the operator is almost entirely relieved of responsibility and the company which advocates the passage of such a measure has nothing but its conscience to direct it.

The Coal Trade and Requirements of Peru

We have heard much of the expected changes that would be wrought in American shipping and trade by the Panama Canal. There is perhaps no portion of the world which will be more strongly influenced than the western coast of both North and South America, while probably no commodity will be more vitally affected than coal.

So far as South America is concerned, the countries lying east of the Andes, with the possible exceptions of the United States of Colombia, and Venezuela, produce practically no coal of their own. West of this mountain range, however, and included therein, the countries are a little more fortunate in their natural fuel supplies. Both Chile and Peru produce coal, but neither country is sufficient at the present time to its own needs.

In Peru, while it is well known that certain regions have considerable coal deposits, these districts lying less than 100 miles from the coast, but two mines have been operated during recent years. These were worked by the Cerro de Pasco Mining Co., at Goyllarisquisga and Quishuarcancha, producing between 600 and 800 tons per day. This coal, however, finds its use in the blast and reverberatory furnaces of the company, and during 1913, there were imported into Peru from foreign countries, 150,660 metric tons (166,074 American short tons) of coal and coke.

The principal obstacle, in the way of developing the coal properties of the land, appears to be limited railroad facilities, and the heavy constructional expense involved in building the same in the rough and mountainous coal-bearing districts.

The value of the coal and coke importations into Peru in 1913, and the countries of their origin, are as follows: Australia, $106,630; Belgium, $38,259; Chile.

$27,933; Germany, $318,198; Netherlands, $45,266; Great Britain, $768,424; United States, $111,544; total, $1,466,227.

That Great Britain has a long established trade between the west coast of South America and Wales, accounts in large measure for the heavy importation of English coal. The vessels bringing this fuel return with sugar, cotton or nitrate, from either Peru or Chile.

The prices paid for Welsh coal alongside in lighters at Callao ranges from 46s. to 50s. or from $11.17 to $12.16 per ton, according to the prevailing freight rate. The importation from Germany consists almost exclusively of coke, which is used by the various mining companies for smelting. The German products alongside at Callao cost about 42s. ($10.20) per ton.

The importations from Australia are of low-grade or gas coal, used mostly by the local gas companies. This costs from 37s. to 40s., or from $9 to $9.72 per ton, f.o.b. Callao.

There are ample facilities for discharging coal at Callao, either to lighters or barges, or upon the docks, the latter, however, costing about 72c. per metric ton. The port charges are: Tonnage dues, 10c. per registered ton; hospital dues, 2c.; dock-companies dues, 6c.; light dues, 1c.; stevedore, loading and discharging, 10c.; ship's broker entrance, $30; clearance, $20. There is no duty upon coal.

Few if any briquettes are now being employed in this country, and within the past 12 months or thereabouts, the Peruvian Corporation, which operates and controls approximately 80 per cent. of the country's railways, has burned oil instead of coal in its locomotives, large quantities of the former product being now produced in this country.

With the opening of the Panama Canal and therewith the ability of many American coal producers to send cargoes direct to the west coast ports from such American shipping points as New Orleans, Mobile and Newport News, it would appear that many of these shippers would be able to successfully compete in this market with European or Australian producers. Certainly American operators receive a lower price for their product at the mine's mouth than do those of Great Britain or Continental Europe, while the distance that the American coal would be required to travel in order to enter the west coast ports of South America is shorter by some thousands of miles than the distance from the European or Australian sources of supply.

Evolution in Trade Conditions in Indiana

Eastern coals for a long time completely predominated the Indiana markets, and it is only in recent years that the local product has come into any extensive use. As a result of an aggressive educational campaign on the part of the Indiana operators, consumers were prevailed upon to give the local fuel a thorough test, with the result that these have, in many instances, been adopted for permanent use.

The Indiana coal has had the reputation locally of being somewhat "dirtier" than other fuels. To overcome this prejudice, operators have been careful to hold their best grades for these markets. As a result of persistent and well directed efforts, the local fuels are now displacing the higher-priced Eastern coals, such as the Hocking Valley, sales of which have been materially reduced. It is now estimated that the Indiana mines furnish from 50 to 75% of all the domestic fuel consumed in the state. A careful estimate made in Indianapolis a few years ago, showed that about 30 per cent. of the sales there were of Indiana coal, and it is conservatively estimated that these have at least doubled since that time. In the southern part of the state about 90 per cent. of the consumption is the local product, but on the eastern border, where the freight rates are more favorable to the Ohio, Pennsylvania and Virginia coals, there is still a moderately large consumption of these grades. As regards the steam coals, the Indiana mines have a practical monopoly of these markets.

Prevention of Accidents from Hoisting

A serious accident at a large colliery has drawn attention to the necessity of adopting precautionary measures in hoisting men from new shafts during sinking operations. An investigation committee recommends that always during sinking, the hoisting engineer should be protected from inclement weather by the erection of a permanent structure over him. They further suggest that overwinding apparatus should always be in use; that portable lamps should be provided instead of carrying an electric cable down the shaft with a single globe lamp attached to it. It is further advised that two sets of engines for raising men be provided, so that one hoisting outfit will always be ready in case of emergency. The provision of roped ladders is likewise recommended.

Inflammation Limits of Gaseous Mixtures

It is interesting to note that British investigators have proved conclusively that minute sparks can be passed through an explosive gaseous mixture without exploding it, although the temperature of the spark is above the generally accepted ignition temperature of the mixture. It was observed, however, that some slight combustion took place in the path of the spark. When the intensity of the spark was increased, the gases exploded.

These experiments would seem to indicate that gas mixtures differ considerably in their ignition temperature. In other words, a gaseous mixture diluted with inert gas, or under reduced pressure, requires a hotter spark to fire it than when it exists under normal conditions. Methane (the chief constituent of firedamp) differs from hydrogen in having a higher ignition temperature and a more prolonged process of oxidation for complete combustion. It is for this reason, in all probability, that in the case of an inflammable mixture containing methane, the source of heat necessary to inflame the mixture must be more intense and must be longer in contact with it than in the case of a hydrogen mixture.

The question of using the energy of large quantities of coal by other means than as a steam producer will have to be faced by coal operators in the not distant future. The truth of this statement is supported by the increasing use of oil for fuel purposes. Why can't we devise a successful method for extracting fuel oil from our coal seams?

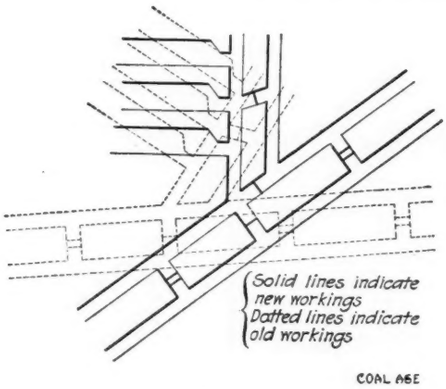
Discussion By Readers

Method of Working Underlying Coal Seam

Letter No. 2—Referring to the proposition submitted by Mr. Lyman, COAL AGE, Aug. 29, p. 357, asking for a discussion of the best method of working a 4½-ft. seam of coal, underlying a 9-ft. seam that had been previously worked out and abandoned, I would say that the method he suggests of driving the entries to the boundary and then working out the coal on the room-and-pillar retreating system, appears to me to be the most favorable, from an economical standpoint.

In the absence of any reliable data in regard to the exact location of the pillars still remaining in the old workings and which would prove a menace to the successful working of the lower seam, I would suggest the following as a precautionary measure:

In order to prevent, as far as possible, an excessive roof weight along a line of least resistance in the new workings, these should be laid out in such a manner that the lines of the entries and rooms in the lower seam will



A PROPOSED PLAN OF WORKING

make an oblique angle with similar lines in the old workings. I have attempted to illustrate this idea in the accompanying sketch, in which the new workings in the lower seam are indicated by the full lines, while the dotted lines represent what may be assumed to be a general plan of the old workings in the seam above. By this means, much of the danger that would otherwise be encountered, owing to a general correspondence of the lines of weakness in both seams, would be avoided. To still further minimize the danger, I would suggest that all openings be made as narrow as possible, consistent with economy and safety, and that larger room-and-entry pillars be provided than would otherwise be necessary.

However, should it be impossible to obtain such a general plan or knowledge of the old workings and it became necessary to develop the lower seam independently, I think that any undue roof stress, owing to unfavorable conditions in the seam above, could be detected by careful observation of their effect in the new workings. I believe, that, by carefully observing the effect produced upon posts, timbers and ribs, it would be possible to adopt precautionary measures, in the way of reinforcing the supports in the lower seams or changing the line of working, so as to overcome the difficulty.

I. C. PARFITT.

Jerome, Penn.

Letter No. 3—In answer to the request for a full discussion of the difficulties presented in the mining of an underlying seam of coal, under the conditions described by Mr. Lyman, COAL AGE, Aug. 29, p. 357, I would suggest that this seam be worked the same as though the coal lying 40 ft. above it was still solid or as though the upper seam were never there. I consider that if the coal in the upper seam has been worked out anyway clean, it will not endanger the work in the seam below.

Under the conditions existing at the present time in coal mining, I do not approve of the method often suggested of driving the entries to the boundary line before starting rib-work; or, what is called the "retreating plan." In order to put out coal at a reasonable cost, there must be a certain amount of rib-work. If the mine is properly laid out, no danger or loss of coal will result by robbing the pillars as the work is advanced. The retreating plan means a large investment for entry driving, track and timber that pays no dividends.

In considering this question at the present time, it may be assumed that the mine is to be equipped with electrical mining machines, which will concentrate the work. The seam being 4½ ft. thick, it is fair to estimate on using a short-wall chain machine capable of producing 100 tons of coal per day, and to determine the number of these machines that will be required for the desired output of the mine. Also, the style of gathering motor to be used in this low seam can be determined and the method of haulage properly planned.

With this information in hand, it is possible to lay out the mine intelligently, with respect to ventilation, haulage and drainage. I would suggest the adoption of the three-entry system for the face headings, using one for haulage and making this the intake airway, another for the return airway and the third for drainage. I would drive the butt entries 250 ft. apart and turn face headings off these, on 120-ft. centers; then open the rooms on the butts, driving them 12 ft. wide, on 25-ft. centers. With a 7-ft. cutter-bar, the ribs could be taken out in two slabs.

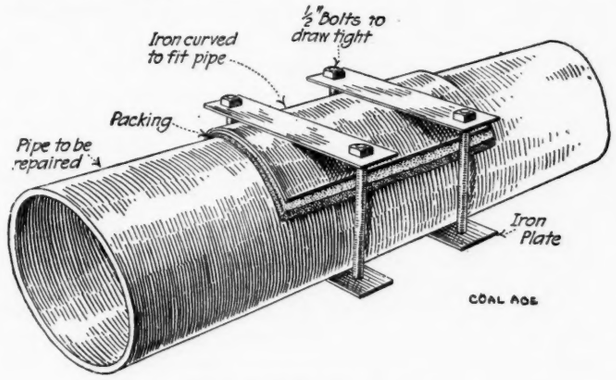
Knowing the required output of the mine, it is possible to estimate the required number of flats and the number of butt rooms that should be working on each flat; and to estimate the necessary volume of air for the ventilation of the mine. As the work progresses, and the roof conditions become known, it may be possible to modify this plan by driving wider rooms or in other ways that will produce better results.

PENNSYLVANIA ENGINEER.

Oliphant Furnace, Penn.

Repairing a Cracked Pipe

N. G. Near's clever method of repairing cracked and dented pipe as described in COAL AGE, Sept. 12, p. 425, calls to mind a method I have often employed to repair a leaky pipe, and which is illustrated in the accompanying figure. This method, on a low-pressure line or where the leak is small, may be regarded as giving results that are practically permanent.



THE PATCH IN PLACE

The blacksmith, taking as a model a pipe the size of the one to be repaired, hammers a small piece of sheet iron into a curve to fit the pipe. A piece of packing is then placed over the crack, the curved iron laid on the packing; and yokes are used on the curved iron and on the pipe on the opposite side from the leak. The patch is then drawn tight by ½-in. bolts, until the leak is stopped.

I have secured good results from this method, and it may be applied quickly and easily from materials always at hand, about the mine.

GEO. N. LANTZ.

New Straitsville, O.

The Ohio Situation

In COAL AGE, Aug. 29, p. 354, Coal Operator, writing on The Ohio Situation, objects to the 47c. rate asked by the miners for run-of-mine coal. He states as follows:

> However, the injustice of this lies in the fact that the Hocking Valley miners have been reduced 2½c. per ton, while an advance of 2½c. per ton has been placed to the credit of the eastern Ohio miners, which allowances, as far as the operators are concerned, certainly give the Hocking Valley operators an advantage of 5c. per ton over last year's prices.

Granting that a state-wide uniform scale, in the present instance, secures to the Hocking Valley operators a slight advantage, it must be remembered that in the past the eastern Ohio operators enjoyed a similar advantage through the operation of a uniform scale. I will endeavor to prove this advantage by the use of Coal Operator's figures.

In making his estimate, he states that last year's price was 69.5c. per ton for screen coal; and that the percentages of slack, for the Hocking Valley, Cambridge and eastern Ohio districts, were 28, 34 and 36 per cent., respectively. The corresponding percentages for screened lump, in the same respective districts would therefore be 72, 66 and 64 per cent. Therefore, for every ton of run-of-mine coal, the eastern Ohio operators paid $0.64 \times 0.695 = \$0.4448$; while the Hocking Valley operators paid for the same, $0.72 \times 0.695 = \$0.5004$. The difference in favor of eastern Ohio was $0.5004 - 0.4448 = \$0.556$; or, approximately, 5½c. per ton.

Considered from a miner's standpoint, the basic justice of the measure is apparent. It requires the same labor to produce a ton of coal, regardless of the percentage of slack; and the miners feel that *equal labor demands equal compensation.* It is this principle that induced the Hocking Valley miners to sacrifice 2½c. per ton for the benefit of the eastern Ohio miners.

GEO. N. LANTZ.

New Straitsville, Ohio.

The Foreigner in Mining

The contrast in tone of letters Nos. 3 and 4, COAL AGE, Sept. 12, p. 440-1, is very striking. These letters relate to the education and treatment of the foreign element in mining.

In letter No. 3, Mr. Parfitt depicts a class utterly void of inherent virtue. He describes them as possessing "a dominant characteristic that is the result of centuries of association with a type of civilization wholly un-American" and a menace to the country. The tone of Mr. Hogarth's letter, No. 4, on the contrary, is optimistic. It teems with encouragement for the mine official and hope for the foreign miner, recking not his foreign birth, ancestors and doctrine.

While one of these writers would debar the foreigner from the liberty he seeks and condemn him for characteristics that are the results of previous environment and for which he is obviously not responsible, the other takes him by the hand and welcomes him to the enjoyment of a freedom, which, it may be assumed, he appreciates, having fled the tyranny and injustice of his own country. While one writer declares this element incapable of improvement and the time and labor devoted to their education as wasted, the other says, "The better they are treated, the better men they become." While one writer is narrow, illiberal and unjustifiably harsh in his judgment, the other is broad and humane; his expressions bubble over with the milk of human kindness.

Personally, I am pleased to be in a position to testify to the loyalty of the foreign miner toward his employer, generally; also, to his ability to mine and load coal or perform any other task in regard to which he has been properly instructed. Experience has taught me that, instead of the time spent in teaching and instructing these men being wasted, it is well spent and productive of good results. Close observation of what many of these men have accomplished only strengthens one's admiration for them, in view of their dominant characteristics, which are described by the first writer as "cunning, subterfuge and duplicity." I am free to confess that these qualities more often describe members of our "pit committees," who have been born and bred in freedom and should possess higher qualities.

Many mine officials can endorse the statement of the second writer, in reference to taking these men "as they come from the old country, fresh from following the plow and watch them grow to be good miners and good citizens generally." And, I doubt if any mine official can recall a foreign miner declaring his belief that "earthly rulers exercise their authority by divine appointment." In-

stead of portraying such a belief, the evidence at hand points most emphatically to the other extreme. The tragic deaths, in recent times, of the kings of Greece, Portugal and Italy, and lastly the assassination of the Crown Prince and Princess of Austria, bear ample testimony that the mind of the foreigner is not "indelibly impressed" as described.

There is still another aspect to this discussion, which the first writer has seemingly overlooked. Whatever the foreign miner is or is not, we know, certainly, that he *is* a first-class man for loading coal. His ignorance of American institutions is excusable and a thorough knowledge of them indispensable, as far as the work in hand is concerned. Indeed, it would be a calamity if this class of immigration were to be replaced by a more highly educated type. We may ask, what would be the effect on the coal industry if none but the "morally educated" and "mentally developed" were admitted to our shores. It should cause no surprise that the foreign miner, for a time, fails to appreciate and often misjudges the privileges that are his in this country. Transported suddenly from his environment of ignorant superstition, which is intensified by the combined efforts of king and clergy to limit his freedom, it is only natural that the lifting of this load should cause the man to rebound accordingly. The fact reveals the wealth of vitality awaiting development under the kind heart and willing hand of a Hogarth to direct it aright.

The foreigner coming to this country judges of its laws and customs by the treatment he receives. His personal contact with people is to him the best and only interpretation of the laws of the country. The harsh treatment of an employer develops a corresponding line of conduct in the workmen. To the credit of this class of immigration, it may be said that the immigrant of a few years ago now sees his sons occupying important positions of honor and trust in all branches of industry throughout this country, notwithstanding the handicap of their dominant characteristics. Experience at the Ellsworth collieries has proved that it pays to educate and instruct the foreign element and to assist him to acquire both the language and a knowledge of what constitutes true citizenship.

In closing, allow me to suggest that all superintendents who are desirous of generating and fostering a proper spirit toward their foreign employees should carefully read Mr. Hogarth's letter and then present a copy of the same to each foreman in his charge, with the instruction that its contents should form the keynote of their conduct toward this class of labor.

CHARLTON DIXON.

Pittsburgh, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Cube Root, Direct Method—(For illustration, $\sqrt[3]{14{,}706.13}$).

Rule—Beginning at units place, divide the number into periods of three figures each, completing the right-hand period of a decimal, if necessary, by adding ciphers.

. . . 14 706.130

Observe the greatest perfect cube contained in the first period on the left and write its root as the first figure of the required root.

$2^3 = 8$; $3^3 = 27$; *hence,* $\sqrt[3]{14} = 2+$ . . . 14 706.130 (2

Subtract the cube of the root found from the first period on the left, and to the remainder annex the second period to form the first dividend.

$14 - 2^3 = 14 - 8 = 6$ . . . *1st dividend,* 6,706

For the first trial divisor, take three times the square of the root found.

$3 \times 2^2 = 3 \times 4 = 12$ *1st trial divisor,* 12

To find the second figure of the root, divide the first dividend, exclusive of the last two figures, by the first divisor. Now, cube the root, and if the cube exceeds the first two periods, diminish the last figure found.

$67 \div 12 = 5+$; $25^3 = 15{,}625$, high . . . *partial root,* 24

Subtract the cube of the root found, from the first two periods, and to the remainder annex the third period to form the second dividend. . . . .

$14{,}706 - 24^3 = 14{,}706 - 13{,}824 = 882$ . . . *2nd divd.,* 882,130

For a second trial divisor ,take three times the square of the root found.

$3 \times 24^2 = 3 \times 576 = 1728$ . . . *2nd dirisor,* 1728

To find the third figure of the root, divide the second dividend, exclusive of the last two figures, by the second divisor. Then, cube the root, and if the cube exceeds the first three periods, diminish the last figure of the root found.

$8821 \div 1728 = 5+$; $245^3 = 14{,}706{,}125$, *low* . . . *root,* 24.5+

Observe the position of the decimal point in the root corresponds to its position in the given number.

Following is the manner of performing the operations:

$\overline{14}\ \overline{706}.\overline{130}$ (24.5+ *required root*

$2^3 = 8$

$3 \times 2^2 = 12)\ 67|06$

5 $25^3 = 15{,}625$, *high, write* 4 *in root*

. . . . . .

14,706

$24^3 = 13{,}824$

$3 \times 24^2 = 1728)\ 8821|30$

5 $245^3 = 14{,}706{,}125$, *low*

. . . . . .

14,706,130

$245^3 = 14{,}706{,}125$

5 *last remainder*

The Coal Age Pocket Book

Fifth Root, a Practical Method—The following is a simple and practical method of extracting the fifth root of a number. The method can be applied to any degree of approximation desired, and is correct as far as it is carried.

Numbers Less Than 100,000—The fifth root of the number is less than 10, and the integral part of the root is a digit. To find this digit, proceed as follows. (For illustration, $\sqrt[5]{23{,}415}$).

Rule—Fnd the two consecutive digits whose fifth powers embrace the given number. The lesser of the two digits is the integer of the required root.

$7^5 = 7 \times 7 \times 7 \times 7 \times 7 = 16{,}807$

$8^5 = 8 \times 8 \times 8 \times 8 \times 8 = 32{,}768$ . . . *integer of root* 7

To find the first decimal figure of the root, take the greater digit four times as a factor, and the lesser digit once. If the product of these five factors exceeds the given number, take the greater digit one less times and the lesser digit one more; and continue thus till the product of the five factors is less than the given number. Divide the sum of these five factors by 5, and the quotient will be the required fifth root of the number to the first decimal.

$8 \times 8 \times 8 \times 8 \times 7 = 28{,}672$, high

$8 \times 8 \times 8 \times 7 \times 7 = 25{,}088$, high

$8 \times 8 \times 7 \times 7 \times 7 = 21{,}952$, low

$\frac{8+8+7+7+7}{5} = 7.4$ . . . . root, to one decimal, 7.4+

To find, in turn, succeeding decimal figures of the root, divide the given number by the fourth power of the root already found; add the quotient to four times that root: and divide by 5.

$(23{,}415 \div 7.4^4 + 4 \times 7.4) \div 5 = 7.48$ . . . *root to two decimals*

$(23{,}415 \div 7.48^4 + 4 \times 7.48) \div 5 = 7.478$ . . . *root to three decimals*

Numbers Greater Than 100,000—The fifth root of the number is greater than 10, and the integral part of the root will then contain two figures. (For illustration, $\sqrt[5]{722{,}180}$).

Rule—Find, by trial, two consecutive numbers whose fifth powers embrace the given number. The lesser of these two numbers is the integer of the required root.

$14^5 = 14 \times 14 \times 14 \times 14 \times 14 = 537{,}824$

$15^5 = 15 \times 15 \times 15 \times 15 \times 15 = 759{,}375$ . . . *integer of root,* 14

To find, in turn, succeeding decimal figures to complete the root, divide the given number by the fourth power of the root already found; add the quotient to four times that root; and divide by 5.

$(722{,}180 \div 14^4 + 4 \times 14) \div 5 = 14.9$ . . . *root to one decimal*

$(722{,}180 \div 14.9^4 + 4 \times 14.9) \div 5 = 14.85$ . . . *root to two decimals*

Fifth Root of Decimals—(For illustration, $\sqrt[5]{2.58}$).

Rule—Complete any decimal period, if necessary, by adding ciphers till the period contains five figures. Then, disregarding the decimal point, follow the rule for integers.

$2.58 = 2.58000$ . . . *as integer,* 258,000

Finally, pointing off as required, $\sqrt[5]{2.58} = 1.208+$

Inquiries of General Interest

Comparison of Coal and Oil as Fuel

Will you kindly answer the following questions relating to the comparative value of coal and oil when employed as fuel in the production of steam:

1. What weight of coal is used, under ordinary conditions in practice, to vaporize 1 lb. of water; or, in other words, under ordinary conditions in boiler practice, what weight of water will be vaporized by the burning of 1 lb. of coal?

2. What amount of commercial oil is required, in ordinary practice, to vaporize 1 lb. of water?

3. What arguments, if any, are there in favor of burning coal and against oil, for the production of steam, assuming that it were possible to obtain heat units at the same cost, in each case?

In this connection, I have under consideration an apparatus that I hope may revolutionize the methods of steam production.

H. N. Freeman, Mgr.,
Vancouver-Nanaimo C. M. Co., Ltd.
Nanaimo, B. C., Canada.

In answering these questions, it must be remembered that much will depend on the character of the coal or oil used, with respect to their respective calorific values. For the purpose of estimate, the calorific power of good bituminous coal may be taken as, say 14,000 B.t.u. The calorific power of petroleum suitable for fuel purposes varies with the specific gravity of the oil, from 18,000 to 21,000 B.t.u. Also, in boiler practice, very much depends on the adaptation of the fuel burned to the particular type of boiler in use. This is true whether coal or oil be employed as the fuel.

With a fair coal and good boiler, it is usual to estimate a consumption of 4.5 lb. of coal, per hp., per hr. Then, since 1 boiler hp. is equivalent to the evaporation of 34.5 lb. of water, from and at 212 deg. F., it may be estimated that 1 lb. of bituminous coal will evaporate $34.5 \div 4.5 =$ say 7½ lb. of water, from and at 212 deg. F.

It is estimated, further, that 1 lb. of crude oil (Beaumont, Tex.) having a specific gravity of 0.92 and a calorific power of 19,000 B.t.u. per lb., when properly burned under a boiler, will evaporate 14.8 lb. of water per hr.

Now, assuming that heat units can be purchased for the same price, in the case of both coal and oil, the ratio of heat values, oil: coal, is 19: 14; but the ratio of evaporation, oil: coal, is 14.8: 7.5. Therefore, on this basis, every dollar invested in oil will only purchase, by weight, $^{14}/_{19}$ of what the same money would buy if invested in coal, but the oil will evaporate 14.8/7.5 times as much water. Hence, the relative values of these two fuels, on this basis, is

$$\frac{14}{19} \times \frac{14.8}{7.5} = 1.38$$

That is to say, every dollar of investment in oil yields, in this case, an evaporation 1.38 times as great as a dollar invested in coal.

A Gaseous Mine

There seems to be much confusion in regard to the question as to what is a gaseous mine, in the meaning of the Bituminous Mine Law of 1911 (Pennsylvania). There are numerous references in the bituminous law, making certain requirements in mines "wherein explosive gas is being generated in such quantities that it can be detected by an approved safety lamp." These references would seem to make it clear that, in the meaning of the law, every mine is a gaseous mine, in which gas is generated in quantities sufficient to be detected by an approved safety lamp.

There seems to be serious doubt, however, as to whether this would be a correct answer to the question, "What is a gaseous mine," if such a question were to be asked in a bituminous mine examination. The doubt as to the correctness of this answer arises from the reading of Sec. 2, Art. 28 of the law, which is as follows:

> The provisions of this act as to mines, or portions of a mine generating explosive gas in quantities sufficient to be detected by an approved safety lamp, shall not apply to any mine wherein explosive gas is being generated only in live entries.

Again, Sec. 3 of the same article reads:

> The provisions of this act shall not apply to any mine employing less than 10 persons inside the mine, in any one period of 24 hr.

These sections of the law make it clear that, unless gas is generated elsewhere than in "live entries," in quantities sufficient to be detected by an approved safety lamp, the mine is not to be classed as a gaseous mine, in the meaning of the law; and is not subject to the restrictions and regulations required by previous sections of the law in relation to the generation of gas in mines. Also, a mine employing less than 10 persons underground is not to be classed as a gaseous mine, in the meaning of the law, regardless as to whether such mine is or is not generating gas in sufficient quantities for detection on the lamp.

This is an important matter, not only because the question may be asked at examinations, but more particularly because there are many mines, in the bituminous region of Pennsylvania, that are being worked as gaseous mines and fulfilling all the requirements of the law, in reference to safety lamps, shotfirers, permissible explosives, etc. I am not saying that these mines should not adopt these precautions; I believe they should. But, according to the clearly defined meaning of Sec. 2, Art. 28, they are not required by law to adopt the precautions they are using of necessity.

James T. Reynolds, Fireboss,
Pine Run Co.
Vandergrift, Penn.

[A full discussion of this question is invited by mine inspectors, mine foremen and firebosses.—Ed.]

Examination Questions

Wyoming Questions (1912)

(*Answered by Request*)

Ques.—Why does gas sometimes fire in a safety lamp and not explode the gas in the air surrounding the lamp?

Ans.—Under different conditions, degree of explosibility of the gas-charged air and the use of lamps of different construction, the firing of the gas may fill the entire chimney of the lamp with flame; or small balloons of flame may form and rise in quick succession within the chimney; or sharp crackling sounds or reports may be heard. The cooler metal of the gauze prevents the passage of the flame outward by cooling the small streamlets of gas and air passing through the mesh, below the point of ignition of the gas.

The flaming of a lamp shows a more or less uniform gaseous condition of the atmosphere in the combustion chamber. The explosive condition is not as acute, in this case, as that producing a crackling noise or sharp explosive reports in the lamp, which fact indicates a less uniform gaseous condition and a higher degree of explosibility of the gas-charged air. The explosion of the mixture, in this case, presumably requires a greater intensity of the igniting flame, resulting in explosions occurring only in direct contact with the flame of the lamp.

Ques.—What is the water gage corresponding to a ventilating pressure of 7.8 lb. per sq.ft.?

Ans.—The corresponding water gage is $7.8 \div 5.2 = 1.5$ in.

Ques.—Find the ventilating pressure in pounds per square foot, when the water gage reads 2.5 in.

Ans.—The unit of ventilating pressure, in this case, is $2.4 \times 5.2 = 12.48$ lb. per sq.ft.

Ques.—With the fan at a constant speed and the airways of equal length, which will pass the greatest amount of air: four airways, each 4x5 ft. in section or one airway, 8x10 ft. in section; and why?

Ans.—A constant speed of fan means, approximately, a constant power on the air. For a constant power, all the airways being of equal length, the quantity of air in circulation is directly proportional to the total area of passage and inversely proportional to the cube root of the perimeter. In other words, the quantity ratio is equal to the area ratio multiplied by the cube root of the inverse perimeter ratio.

In the present case, the total areas and perimeters are as follows:

Four airways, 4x5 ft.;

$a = 4\ (4 \times 5) = 80$ *sq.ft.*; $o = 4 \times 2\ (4 + 5) = 72$ *ft.*

One airway, 8x10 ft.;

$a = 8 \times 10 = 80$ *sq.ft.*; $o = 2\ (8 + 10) = 36$ *ft.*

The total areas being equal, the area ratio is 1, and the inverse perimeter ratio is $^{36}/_{72} = 0.5$; hence,

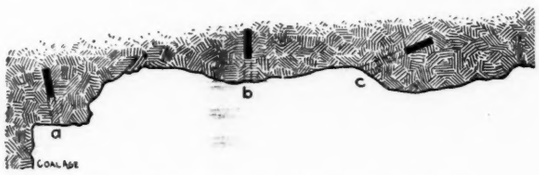
$$quantity\ ratio = 1 \times \sqrt[3]{0.5} = 0.793$$

That is to say, four airways, each 4x5 ft., will only pass 0.793 of the quantity of air the same speed of fan will circulate in a single airway, 8x10 ft., all the airways being of the same length.

Ques.—What are the dangers of shooting off the solid in dry and dusty mines, and what precautions would you take to prevent accident?

Ans.—The practice of shooting off the solid frequently causes what is termed by the miners a "tight shot." When the method is properly employed, there is no danger in its use, except under exceptional conditions where the coal is extremely friable or inflammable and the seam is generating gas. In many cases, the coal is not mined; it is never sidecut; and too often the shot is bound by projecting tops or bottoms, which give the powder little or no opportunity to perform its work of breaking down the coal.

In the accompanying figure are shown a rib-shot, at *a*; a "dead" shot or hole, at *b*; and a "grip" shot, at *c*. The two shots last named are employed in the practice of



BLASTING AT THE FACE OF A ROOM

shooting off the solid. Commonly, the miner selects a favorable place in the face of the coal, as at *c*, where a grip shot, if not too deeply laid, will perform good work. The temptation is too strong, however, to locate the charge too deeply on the solid; or even to put in a dead hole drilled normal to the face of the coal, as at *d*.

The tendency, in the past, has been to use too heavy a charge; depending on the strength of the powder to blow down the coal, and not assisting the shot to perform its work by properly undermining the coal. The result is a tight shot that blows out its tamping, without breaking down the coal. Almost the entire energy of the powder is, in this case, expended on the air, which produces a heavy concussion and raises a cloud of dust. The blast is accompanied with a volume of flame that is projected from the hole with great force, igniting the cloud of dust and causing a local explosion that may, and frequently does, develop into a mine explosion involving the entire underground workings. To prevent such occurrences, miners should use a limited charge of powder sufficient only for the work it must perform in breaking down the coal. In every case, the coal should be properly mined or the shot so located that it is free to perform its work.

Ques.—What useful purposes do overcasts and undercasts serve, in mine ventilation; and which of these do you prefer, and why?

Ans.—Overcasts and undercasts are two forms of air bridges or air crossings employed to carry one air current over or under another. They serve as a means of ventilating cross-headings, without the use of doors. Overcasts are generally preferred as they cannot be flooded and are easier to keep air-tight.

Coal and Coke News

Harrisburg, Penn.

Testimony was presented in the Dauphin County Court on Sept. 25, by the United Mine Workers' organization of the Schuylkill and Lehigh regions, that some men returned by the Examining Boards of the several districts as eligible for mine foremen's and assistant mine foremen's certificates had never been employed in the actual cutting of coal at the face, and that others had been so employed only a short time.

The testimony was given in the mandamus proceedings brought against the Chief of the Department of Mines to restrain the issuing of certificates of eligibility to some of the men recommended by the boards, and the case brought by the union officials against the issuing of certificates to certain men, who they allege never had had actual experience at the face.

Involved in the action is the question whether the term "five years' practical experience as a miner" means five years' employment inside the mines or five years in the actual cutting of coal. For years it has been alleged that men were returned as competent to act as mine foremen and assistant mine foremen who did not possess qualifications for these positions, and some months ago the mine workers' union brought suit mentioning the names of men who, it was declared were not experienced in digging coal.

Some of these witnesses were heard. Mine inspectors and an expert employed by the Philadelphia & Reading Coal & Iron Co. to ascertain the efficiency of miners, testified as to the understanding of the term "miner" in the anthracite coal region, saying that it meant the man who gets out the coal, but they did not confine their opinion strictly to the cutting or blasting of that mineral.

The Attorney General's department has held in two opinions on the language used in the law that the five years' practical experience meant employment in the mine, not necessarily that a man had to be a digger of coal for the period of five years. And it was on the strength of this opinion that many of the candidates appearing before the examining boards took the oath that they were miners before entering the examinations.

It was the opinion of the mine inspectors, that the term, "five years' practical experience as a miner" should include not less than two years at actual cutting or blasting coal at the face, for in that time any intelligent man could become an expert at this part of mining and about three years' experience at setting timber and double timbering, building brattice, batteries, removing gas, track-laying, etc., but, that such occupations as driving, door tending, tending foot or top of shaft or slope should not be considered in the term of "practical miner." It was also brought out that it is the men with general experience that make the best foremen, for it was pointed out that a man might work at the face for 20 years cutting coal, and never know how to brush gas, place a double set of timber, or lay a good track in his place which he is supposed to do or timber a locality where a fall has occurred. It was stated that with but few exceptions it was the men with general all around experience that stood the examination.

It was argued that the number of persons competent for filling such important positions as foreman, and assistant mine foreman in the first place is very small. It was shown that a mine foreman or assistant foreman should be a person somewhat acquainted with geology, so as to know the formation surrounding the locality where he is employed. He should understand and know something about mine maps; while it isn't necessary for him to be a chemist, he should know the different gases met with in the anthracite coal mines. He should also have some knowledge of engines, for today most of the coal is being transported by air or electric locomotives; mine pumps he should be well acquainted with; also the sinking of shafts and slopes; ventilating fans and the method of operating the same; he should also be familiar with track laying.

He should be able to timber shafts, slopes, and gangways; in fact, he should be an all around miner. He should be acquainted with all the different seams of coal, so as to determine the size of pillars to support the roof, according to the nature of the coal and the depth of the mine. In case of an accident he should be cool-headed and determined in carrying out his instructions and a fair judge of human nature. There is no doubt that it would add greatly to his success to know how to mine coal properly in the different seams and on different pitches, but the great question is, "can enough men be selected from the face of breast or gangway to meet with those requirements, which are necessary to make a successful mine foreman or assistant mine foreman?"

If the parties back of this case are sincere in dealing with a question of practicability, why advocate things that might be detrimental to the same cause, for at the last two sessions of the legislature a great pressure has been brought to bear on the mines and mining committee to pass a law making all mine foremen eligible for mine inspector without standing an examination.

Final argument will be heard on Oct. 12.

PENNSYLVANIA

Anthracite

Hazleton—While many towns in the anthracite field have suffered serious results from the prolonged drouth, Hazleton and vicinity have not yet felt its effects. None of the local collieries or factories have curtailed operation on account of a scarcity of water.

Shenandoah—The No. 12 washery at Coal Dale has resumed operation after being idle almost all summer undergoing extensive alterations.

Bituminous

Pittsburgh—The H. C. Frick Coke Co., as noted in our issue of last week, has completed a remarkable working model of the Phillips plant of the company. This shows the mine tipples, power plant, boiler houses, machine shops, lamp houses, and even the bath house. This exhibit will be included with other displays of the U. S. Steel Corporation at the Panama-Pacific Exposition next year, showing various methods adopted to prevent accidents in the corporation's safety-first campaign.

Church Hill—The Dutch Hill mine of the Hedstrom Coal Mining Co., of Buffalo, situated in the Allegheny Valley, Church Hill post office, has been sold to the Church Hill Mining Co. It has a capacity of about 300 tons a day, and has been in operation most of the time of late. The new company is controlled by the Monterey Coal Co., and will be superintended by A. J. Watson of that firm.

WEST VIRGINIA

Elverton—Determined to capture the men who on Sept. 10 fired from ambush on unarmed workmen and the manager's residence, the Branch Coal & Coke Co. has recently increased the amount of the reward offered from $1000 to $5000.

Charleston—The first definite results of a failure of a labor employing corporation in West Virginia to come under the provisions of the Workmen's Compensation Division of the Public Service Commission Act and pay its premium was recently made public. The Piney Mining Co. elected to come under the provisions of the statute last October when it first went into effect, but has never paid any of its premiums. One of its employees, Antonio De Francisco, was awarded a pension for permanent disability for injuries received in this company's mine in the sum of $7.98 per week for life. The Commission found, however, that the mining company has never paid its premium and the pension could not be paid. Francisco brought suit, and secured a judgment of $5000. It is said that the company's total premiums for the year would not have exceeded $2500.

Bluefield—Official figures covering shipments of coal from the West Virginia fields over the Norfolk & Western R.R. during August have been published in detail, showing a slight decrease in business as compared with the preceding month. From the various fields covered, shipments for the month totaled 2,450,808 tons, divided as follows: Pocahontas, 1,227,621 tons; Tug River, 93,179 tons; Thacker, 286,572 tons; Kenova, 105,725 tons; Clinch Valley, 134,408 tons; Miscellaneous, 4210 tons; Williamson and Pond Creek connection, 91,813 tons, and other railroad connections, 257,280 tons.

ALABAMA

Birmingham—The Alabama Co., one of the largest producers of coal, coke and iron in the state, has completed its improvements at Ironton, this work including the relining

of No. 2 furnace. While the furnace was idle the company rebuilt and improved its washers and constructed a concrete dam to provide an abundance of water. All of the coal mines are running, and the ore mines, with one exception, are running full time.

Clanton—In boring for water for the use of the local water-works company, contractors have struck oil and coal. New machines are on the ground and are now boring for these products instead of water. It is reported that the coal is of good grade and thickness, and further investigations are being rapidly pushed.

TENNESSEE

Oswego—Representatives of the United Mine Workers of this section are meeting here in connection with a committee representing the operators in the Jellico district. Satisfactory results have been reached at all conferences held heretofore and it is trusted that an agreement will be reached without difficulty.

Knoxville—Large numbers of miners and others interested in that industry are expected to gather here on Oct. 15, for the proposed miners' field day which is being prepared for conditionally. J. M. Webb, officer in charge of the local station of the Federal Bureau of Mines, is awaiting further instructions from headquarters before proceeding with preparations for this event.

KENTUCKY

Owensboro—Damage superficially estimated at $1200 was done to the superstructure of Malinger's mine, operated by Frank Schultz, near here, recently when fire broke out in the buildings on the surface. A quantity of powder in kegs was exploded and it was several hours before any attempt could be made to extinguish the flames, the heat was so great. It is as yet impossible to estimate the damage down in the shaft, though the upper timbers were badly burned. Repairs will be made immediately. There was no insurance.

Whitesburg—Coal shipments from the new operations at Wayland and Weeksbury, on Beaver Creek, north of here, have been doubled and production is at the rate of 40 cars a day and still larger increases are promised for the immediate future.

Pineville—The mines, leases and all other property of the Big Hill Coal Co., of Bell County, were knocked down for $1100 to H. B. Hauger, of Richmond, Ky., representing the bondholders, at a sale held here by the commissioner of the Federal court recently. The price named is so small, it is expected here that the Court will hardly confirm the sale, as the property of the company is understood to be worth many thousands of dollars. The company's holdings include about 1000 acres of coal land on the left fork of Straight Creek and the mine equipment is said to be exceptionally good and installed at heavy expense. The mines at one time were operated with much profit and their failure is attributed to inefficient management.

OHIO

Columbus—While it is only a little over a month since the new mine-run system of paying for coal mined in Ohio has been in force, some of the operators are speculating on the question if it has increased the cost of mining. Some are of the opinion that it has not increased the cost while others say that an advance of approximately 8 per cent. in the cost of producing coal has resulted from the changed conditions.

Martins Ferry—It has been announced that the Blockhouse mine at Brilliant has resumed work. This operation was ordered by the Federal Court on May 20 to operate under the 47c. rate and was immediately closed down because it could not make money.

Considerable excitement has been created by the circulation of a rumor to the effect that the Lorain Coal & Dock Co. is contemplating dismantling one of its largest mines and moving the equipment to the Hocking district. Officers of the company refuse to discuss this matter.

INDIANA

Terre Haute—Mines in this vicinity which make a specialty of coal for domestic use have been working full time for some weeks past. Other mines depending mostly on orders for steam coal, especially screenings, are running on an average of about four days per week. There are more than enough cars for the output, and railway officials say they have so planned ahead that there will be no shortage of cars this winter.

Vincennes—An unidentified man was killed under a fall of coal and two others severely burned in a gas explosion at Indiana Creek recently. Three hundred men were in the mine at the time of the explosion, and it took half an hour to effect their rescue.

Brazil—The Association of Block Coal Operators recently declined to have a conference with the mine workers officials of their district over the discharge of a miner at De Camp mine No. 4 for the alleged reason that he did not patronize the company store. This is the first time for several years that the miners have raised the company store question. There are few of these stores in the mining districts of the state now.

ILLINOIS

Pana—A fire which recently broke out in the Tower Hill coal mine east of Pana, threatened the mine's destruction with enormous loss to the owners. This fire was started from a gas explosion in an entry caused by a blown-out shot. The flames spread rapidly, but all the men were gotten out safely.

Marion—The Illinois Hocking mine, which has been idle since the workings caught fire about 18 months ago, was recently sold by the receiver to Jacob Goodall. It is understood that the price paid was $6000, the property being subject to the miners' wages, which are still held against it. It is believed that an effort is being made to reopen the property.

Millstadt—The High Prairie mine, the largest open strip pit in southern Illinois, which has been idle for the past seven months, is expected to open up in the course of the next 10 days.

Murphysboro—Blair mine No. 1 on the M. & O. is practically worked out, and unless some arrangements now under way are perfected, whereby some additional acreage can be secured, the mine, it is expected, will be abandoned within the next 30 days.

COLORADO

Denver—Of the number of men indicted by the Las Animas County grand jury in conection with the coal strike war, 78 have been arrested. John R. Lawson is charged with 12 murders and with one case of arson. It is recommended that Deputy Attorney-General West represent the state in the prosecution, for the reason that the district attorney is in such sympathy with the striking miners as "must inevitably embarrass him to be called upon to prosecute these cases."

UTAH

Salt Lake City—The coal producers of Utah have united in requesting the United States Government to construct at the naval coaling station on San Francisco Bay, a terminal that will make it possible to deliver Utah coal to the Pacific fleet at that point. The local operators have received some encouragement from the government and are confident that coal used by the United States Government on the coast will be supplied by Utah. This will mean an added production of about 100,000 tons to the annual output of the state.

PERSONALS

J. W. Reed, of Jenkins, Ky., has been appointed instructor in mining machinery at the Kentucky State University School of Mines, at Lexington, to succeed T. J. Barr, who has been made professor of mining engineering.

W. K. Kavanaugh, president of the Southern Coal, Coke & Mining Co., of St. Louis, is at the present time on an extended trip along the Atlantic Seaboard of South America. He is now in Venezuela, looking into a future market in South America for Illinois coals.

G. A Gent, for many years an operator in Williamson County, Illinois, and until recently a resident of St. Louis, and well known in coal trade circles throughout this section, has leased for development 2500 acres of coal lands from the Crystal Block Collieries Co. The property is in Eastern Kentucky.

PUBLICATIONS RECEIVED

Department of the Interior, U. S. Geological Survey. "The Manufacture of Coke in 1913," by Edward W. Parker. Sixty-five pages, 6x9 in.; unillustrated.

Department of the Interior, Bureau of Mines. "Electric Lights for Use About Oil and Gas Wells," by H. H. Clark. Eight pages, 6x9 in.; unillustrated.

The University of Texas, Bureau of Economic Geology and Technology. Bulletin No. 363. Scientific Series No. 28. "The Deep Boring at Spur," by J. A. Udden. One hundred and nine pages, 6x9 in.; illustrated.

Department of the Interior, Bureau of Mines. "Report of the Committee on Resuscitation from Mine Gases," by W. B. Cannon, Geo. W. Crile, Joseph Erlanger, Yangell Henderson and S. B. Meltzer. Thirty-six pages, 6x9 in.; illustrated.

Department of the Interior, Bureau of Mines. "Monthly Statement of Coal Mine Fatalities in the United States," July, 1914; with revised figures for preceding months. Compiled by Albert H. Fay. Twenty-one pages, 6x9 in.; unillustrated.

Department of the Interior, Bureau of Mines. "The Origin of Coal," by David White and Reinhardt Thiessen; with a chapter on the Formation of Peat, by Charles A. Davis. Three hundred and eighty-one pages, 6x9 in.; with many illustrations.

Department of the Interior, Bureau of Mines. "Supplementary List of Permissible Explosives." A single sheet, 6x9 in., listing the permissible explosives tested by the Bureau of Mines between Jan. 1 and Aug. 1, 1914. This sheet is intended to supplement Technical Paper No. 71.

TRADE CATALOGS

C. C. Hatfield, Duquoin, Ill. "The Loading Boom that Loads to Perfection." Six pages 5½x8½ in. illustrating and describing the Hatfield loading boom.

The C. L. Smith Co., 3200 Hadley St., Milwaukee, Wis. "The Smith-Chicago Mixer." Sixteen pages, 6x9 in.; illustrating and describing the Smith-Chicago mixer.

The A. F. Daum Co., Pittsburgh, Penn. "The Daum Refillable Cartridge Fuse Shells for Electric Light and Power Circuits." Sixteen pages, 3½x6 in.; illustrated.

RECENT COAL AND COKE PATENTS

Mine Door—J. F. Dillon, Dante, Va., 1,107,045, Aug. 11, 1914. Filed Feb. 6, 1914. Serial No. 816,977.

Boiler. W. H. Wood, Media, Penn., 1,106,908, Aug. 11, 1914. Filed Oct. 18, 1913. Serial No. 795,862.

Smoke Preventer. T. W. Langan, Albany, N. Y., 1,104,909, July 28, 1914. Filed Apr. 22, 1913. Serial No. 762,766.

Furnace Cleaner. C. F. Hahle, Riverside, N. J., 1,106,093, Aug. 4, 1914. Filed Nov. 4, 1912. Serial No. 729,340.

Furnace Grate. O. H. Erdman, Birmingham, Ala., 1,105,636, Aug. 4, 1914. Filed Feb. 9, 1914. Serial No. 817,397.

Grate for Furnaces. P. Von Zeipel, Duquesne, Penn., 1,105,-054, July 28, 1914. Filed July 2, 1910. Serial No. 570,103.

Fire-Box Construction. J. M. McClellan, Everett, Mass., 1,105,526, July 28, 1914. Filed June 23, 1910. Serial No. 568,507.

Furnace Wall Construction. N. E. Maccallum, Phoenixville, Penn., 1,106,725, Aug. 11, 1914. Filed May 13, 1913. Serial No. 767,305.

Water Circulator for Boilers. J. Tait, Dunedin, New Zealand, 1,106,749, Aug. 11, 1914. Filed Mar. 7, 1912. Serial No. 682,082.

Steam-Boiler Construction. J. A. Wolmer, Indianapolis, Ind. 1,106,066, Aug. 4, 1914. Filed Dec. 24, 1913. Serial No. 808,598.

Apparatus for Promoting Combustion in Furnaces. E. C. Read, Franklin, Penn., 1,106,583, Aug. 11, 1914. Filed Feb. 2, 1911. Serial No. 606,100.

Process of Manufacturing Artificial Coal from Peat. F. C. Osius, Grand Rapids, Mich., 1,105,206, July 28, 1914. Filed Apr. 22, 1911. Serial No. 622,786.

Method of Working Coke Ovens. H. Koppers, assignor to H. Koppers Co., Chicago, Ill., 1,105,522, July 28, 1914. Filed Nov. 15, 1913. Serial No. 801,107.

Anthracite-Burning Grate for Furnace. W. McClave, assignor to McClave-Brooks Co., Scranton, Penn., 1,105,572, July 28, 1914. Filed Mar. 21, 1913. Serial No. 755,939.

Superheater. G. H. Emerson and H. Yoerg, assignors to Locomotive Superheater Co., a corporation of Delaware, 1,105,633, Aug. 4, 1914. Filed Dec. 18, 1909. Serial No. 533,955.

Division Wall for Water Tube Boilers. W. F. Sellers and H. B. Bradford, assignors to Edgemoor Iron Co., Edgemoor, Del. 1,105,213, July 28, 1914. Filed Sept. 10, 1912. Serial No. 719,512.

CONSTRUCTION NEWS

Hazard, Ky.—The Hazard-Dean Coal Co. has just completed the installation of its $15,000 electric power plant, to supply the power used in the company's workings. F. J. Walcott superintended the installation of the plant.

Youngstown, Ohio—Plans have been prepared by the Carnegie Steel Co. for the construction of a byproduct coke plant. The plans provide for 56 Koppers ovens having a capacity of 16 tons each daily. The byproducts will consist of tar, gas and amonia sulphate.

Hartshorne, Okla.—Plans have been prepared by the Rock Island Coal Mining Co., covering electric hoists and electric equipment for shafts Nos 9 and 10, to be installed next spring. At No. 10 the hoist shaft is now down 600 ft., and the air shaft 400 ft. At mine No. 9 at Alderson the hoisting shaft is down 680 ft., and slope 42 it is now down to 1000 ft.

Coshocton, Ohio—The local directors of the Ohio Cannel Coal Co., as well as capitalists from St. Louis, Mo., are contemplating arrangements for the development of the company's mine in Bedford Township. Those owning a controling interest in this project are S. C. Priest, of Walhonding; George P. Heckle, of St. Louis; John Orr, of Warsaw, and Simon Ashcraft, of West Carlyle.

Athens, Ohio—The Hocking Power Co., which is erecting an immense power plant at Floodwood, Ohio, for the purpose of supplying coal mines in this vicinity with electric current has closed a contract with the city of Athens, by which it takes over the city electrical plant at $16,000. The company has also secured a franchise from the city government to furnish current for a period of 25 years.

Charleston, S. C.—The Southern Ry. has awarded the contract for the construction of modern coal dock facilities at Charleston which will enable the Virginia & Southwestern Ry. and the Southern Ry. to handle coal from the fields of the South to this port. The dock, which will be built by the Wellman-Seaver-Morgan Co., of Cleveland, Ohio, will be constructed on property on the Cooper River containing about 120 acres, and having more than 4000 ft. of river front. The plant is designed to deliver coal to vessels at the rate of not less than 2000 tons per hour. About $450,000 will be expended in this work.

NEW INCORPORATIONS

Richmond, Va.—An amendment has been filed to the charter of the Mason Coal & Coke Co., a West Virginia corporation, reducing its capital stock to $135,000.

Seattle, Wash.—The Bolcom-Sligh Coal Co., of Seattle, has been organized with a capital of $10,000, by Charles R. Sligh, H. S. Bolcom, W. M. Bolcom and W. Y. Henry.

Tacoma, Wash.—The Summit Coal Co., of Tacoma, has been organized with a capital of $10,000 by H. M. Shovlain, James Marucha, Louis Sonney and Helen Schmitz.

Joplin, Mo.—The Higgins Land & Mining Co. has been organized with a capital stock of $80,000. The incorporators are F. S. Higgins, D. E. Miller and C. J. Martin.

Muskogee, Okla.—The Fidelity Fuel Co. has been incorporated here, with a capital stock of $10,000, by E. H. Bradley, Scott Kelly of Muskogee, and Fred Raurk of Kansas City.

Peoria, Ill.—The Gorman Coöperative Coal Co. has been organized to mine, sell and deal in coal. The incorporators are James Gorman, Gustav Forsten, Sam Angelo, Maurice Gorman and Alva Pitcher.

Brookville, Penn.—The Dilltown Smokeless Coal Co. has been organized with a capital of $5,000. The incorporators are E. E. Henderson, of Brookville; T. R. Williams and E. E. Hewitt, of Punxsutawney.

Charleston, W. Va.—The Jackson Coal Co., of Charleston, has increased its capital stock from $5000 to $570,000, and will soon take over 6000 acres of coal land in Jackson County, Ill.

Boston, Mass.—The Canadian Atlantic Coal Co., Ltd., of Boston and Richmond, N. S., has been incorporated under the

laws of Massachusetts with an authorized capital of $1,250,000, comprising 2500 shares of preferred stock and 10,000 shares of common. The preferred is 10 per cent. cumulative.

Carthage, Mo.—A certificate of incorporation has been issued to the Hugo Mining Co., of Carthage, with a capital stock of $3200. The incorporators are Louis Gratz, Mack Logan, Charles Wright and R. F. Glenn, all of Carthage. This firm is now developing mining properties near Joplin.

Bonanza, Ark.—The Woodson-Barr Coal Co. has been organized here, with M. M. Woodson, president; John Barr, vice-president, and Harry Reinhardt, secretary and treasurer, to further develop coal mines. Daily capacity now 300 tons. The name was changed from the Woodson-Strickland Coal Co.

Heberton, W. Va.—The Willis Branch Coal Co. of Herberton, Fayette County, has been organized with an authorized capital of $50,000. The chief works will be in the Fayette district, and the incorporators are Thomas K. Laing, M. P. Laing, L. E. Hiner, George W. Waring and Carl M. French, all of Beckley.

Charleston, W. Va.—A charter has been issued by the secretary of state to J. V. Thompson and others, of Uniontown, Penn., for a $2,000,000 coal company to be known as the Wetzel Coal & Coke Co. to take over and hold 19,250 acres of coal in the Clay and Church districts in Wetzel County. The chief works will be located on the Baltimore & Ohio R.R. near Littleton, and the main office and headquarters will be in Fairmount.

INDUSTRIAL NEWS

Easton, Penn.—The Thomas Iron Co., of Easton, recently blew in its No. 7 blast furnace at Alburtus, using as fuel part coke and part anthracite.

Washington, D. C.—By a viva voce vote, the Senate, on the afternoon of Sept. 26, passed the Alaska Coal Land Leasing bill, which then went to the President for final approval.

St. Louis, Mo.—The Southern Coal, Coke & Mining Co. has secured the Union Pacific R.R. contract for the coming season, which calls for 300,000 tons of Illinois coal.

Mobile, Ala.—Inaugurating the export of Birmingham coal to South America by way of the port of Mobile, the Uruguain steamer "Domingos J. De Silva" cleared recently for Buenos Aires, Argentina, with a cargo of 2964 tons of Alabama fuel.

Victoria, B. C.—The Manaimo Gas Co. of Victoria has succeeded in manufacturing standard illuminating gas of uniform quality from low-grade coal-mine refuse. The process has been in daily operation at Nanaimo for the past six months. The company has also successfully piped this gas as fas as Victoria, about 60 miles.

Columbus, Ohio—Arrangements were recently completed for a conference of traffic managers of the various commercial organizations of Ohio with the traffic managers of railroads in Central Traffic Association territory to be held at Columbus, Oct. 2, to discuss matters relative to the increase of five per cent. in rates permitted by the Interstate Commerce Commission.

Birmingham, Ala.—A cargo of briquette pitch, valued at $60,000, is being loaded by the Barrett Manufacturing Co. for Genoa, Italy. The cargo, which is being handled through a London broker, is being loaded on the L. & N. R.R., and will amount to about 5600 tons. This shipment is not due to the war, as this company has previously made shipments to the same consignees.

Chattanooga, Tenn.—Title to the plant site in Alton Park donated by the Chamber of Commerce to the Chattanooga Gas & Coal Products Co., has been transferred to the Central Trust Co., of New York trustee, for part security on the coke company's first mortgage, six per cent., six-year sinking fund gold notes to the amount of $500,000. President Lewis T. Wolle and others, agree to similarly transfer all other property which may from time to time be acquired, the usual phraseology being used.

Sharon, Penn.—The United States Steel Corporation has held up appropriations for improvements to many of its mills here and elsewhere, owing to unsettled financial conditions. Some time ago this corporation appropriated $500,000 for additions to the coking plant of the Carnegie Steel Co., at Farrell, for the manufacture of the byproduct, benzol. Plans were completed and preparations being made for beginning the work, when orders came to hold up the proposition. It is said that this corporation will make only those repairs which are absolutely necessary.

Wheeling, W. Va.—The coal traffic on the Baltimore & Ohio R.R. since the 1st of September has been the heaviest in the history of the line. From that date on, an average of between 600 and 800 cars of coal have been handled daily. The major part of this traffic is being brought to Benwood Junction by way of the Short Line and Ohio River Road. The largely increased coal traffic being handled by the road has been created by the long strike in the eastern Ohio field; 90% of the West Virginia coal is going to the ports of Lorain and Cleveland for shipment up the lakes.

Columbus, Ohio—The Baltimore & Ohio R.R. Co. has promulgated a new set of reweighing rules, applicable to coal cargoes which will become effective Oct. 24. According to B. F. Nigh, secretary of the Michigan-Ohio-Indiana Coal Association the new rules are much fairer than those in vogue previously. The application of Mr. Nigh for new rules which was to have been heard by the Ohio Public Utilities Commission, Sept. 25, was postponed because of the action of the Baltimore & Ohio and it is not likely that they will be brought up again.

Birmingham, Ala.—Dr. A. Crovetti, of Genoa, Italy, was in Birmingham recently accompanied by Walter L. Loeb, of New York, as interpreter looking over the field with a view to placing an order in Alabama for 50,000 tons of coal per month for steel works in Genoa, which Dr. Covetti represents. Cables are now being exchanged between Genoa and the New York offices of Birmingham corporations, and if financial arrangements are satisfactory the order will be placed in this district. Railroads are figuring on cars, and if the sale is consummated the coal will be shipped through Mobile. Pensacola and New Orleans.

Philadelphia, Penn.—Fuel shipments on the Pennsylvania R.R. east of Pittsburgh and Erie in August, with the exception of anthracite, fell off from the figures of the same month of the previous year. They were also smaller for the eight months' period, the only increase being in anthracite. The number of tons of this latter fuel carried in the month was 805,585, the increase being 93,134. Of bituminous, 4,299,810 tons were hauled, being a decrease of 262,529 tons; 792,656 tons of coke were handled, being a decrease of 368,828 tons. The total tonnage was 5,898,051, being a decrease of 539,223 tons. During the eight months' period, a total of 45,842,432 tons of fuel were handled. This was a decrease over the same period of the preceding year of 4,136,942 tons.

Philadelphia, Penn.—When, on Aug. 1, communications were interrupted betweeen the German factory and the American distributing and manufacturing agency of the Hess-Bright Manufacturing Co., steps were immediately taken by the American branch to provide manufacturing facilities in order to supply ball bearings of the sizes wherein shortages in the stock then on hand might occur. Although much of this work is being done outside of the Hess-Bright factory, it is in strict accordance with specifications and must pass the same rigid inspection as the goods heretofore imported from Germany. At the present time, although bearings are now being shipped from Berlin, the firm is proceeding on the independent basis of manufacturing here.

Owensboro, Ky.—Sale of all the property of the Fern Hills Coal Co. is asked by a suit filed in the Circuit Court here by trustee for the bondholders of the company. Paul Lehman, Edwin Hodde, A. J. Kirst, W. V. Doogs and Charles Powell, holders of five of the sixty $1000 bonds issued five years ago by the coal company are plaintiffs and numerous defendants are named, including the receiver of a defunct bank, among the assets of which were 35 of the same bonds. Interest on the bonds is alleged to have been defaulted for 30 days, making unpaid bonds immediately due, according to their provisions. All of the coal company's property, consisting of coal rights, tipple and necesssary operating equipment, was mortgaged for the bondholders' benefit and sale of the property to satisfy their claims is asked.

Toronto, Canada.—The new railway rates and regulations in force in Western Canada since Sept. 1, have improved shipping conditions so that the output of the mines of the Canadian Coal & Coke Co. in Alberta will be largely increased. At the Pacific Pass Colliery on the headwaters of the Pembina River, connected with the Grank Trunk Pacific by the Coal Spur branch, development has reached a point where an output of 2000 tons per day would be possible. The present production of 700 tons per day, employing a force of 150 men, it is proposed to increase as the company is now competing for the Winnipeg market and will also enter the field westward to Prince Rupert. The St. Albert mine operated by the same company has a seam 7½ ft. thick at a depth of 320 ft., which has been developed under difficulties owing to quicksand, which are now obviated by a concrete lined shaft. About 25 men are employed but this force will be increased during the winter as the demand warrants.

Coal Trade Reviews

General Review

Domestic grades of anthracite in strong demand, but steam sizes are heavy. Bituminous still slowing down, though prices are well maintained. Industrial demand suffering from the generally adverse conditions.

The anthracite market is steadily improving as the season advances, the recent cool weather having had a particularly beneficial effect. Domestic consumers who deferred buying during the discount period in the summer have been forced into the market by the lower temperatures, and this has created a general activity. The Lake business is also somewhat larger at the moment, but it has now reached the maximum for the season. The situation is not so favorable in the steam sizes, which are feeling the same general heaviness that characterizes the bituminous trade. Substantial discounts on the regular circular are noted on the small sizes, but the domestic grades are holding firm at the full circular. Operations in the mining districts are at practically full capacity.

The export bituminous trade continues in fair volume, but there is a growing uneasiness over the curtailed steam consumption. The one encouraging feature in the situation is the fact that the market is showing indications of an excellent undertone, and will no doubt respond quickly to any improvement in general conditions. The better grades of coal are still rather closely held. Prices are well maintained so far, and there is an absence of the customary large tonnages of demurrage coal, which usually characterize a weak market. It is none the less a fact that shipments are confined almost entirely to contracts, requisitions on which are reduced to a minimum, and there must be some favorable developments shortly to avoid a slump.

The Pittsburgh market is still losing ground in all directions; the steel mills are only operating at half capacity, with indications of a still further reduction shortly, and the manufacturing demand is again tapering off. The market has been thoroughly combed for orders, but consumption is at the minimum, and will continue so until there is a general resumption in industrial lines. Canadian manufacturing is heavily curtailed, so that fuel requirements are restricted and American operators are inclined to be suspicious of this business in any event. The market is very irregular, circular prices being purely nominal and obtained only on the very best grades.

The Ohio situation is unsatisfactory, the domestic grades having now suffered a relapse in sympathy with the steam coal. Lake shipping has reached the maximum, though it will probably continue until the close of navigation. Operators in the Southern markets are showing a more persistent interest in the export business than is generally the case through the East and the opinion is freely expressed that there will be a considerable tonnage shipped to South America during the next six months. Business locally is stagnant, the railroads suffering more or less severely from the depressed conditions prevailing in both the cotton and steel industries.

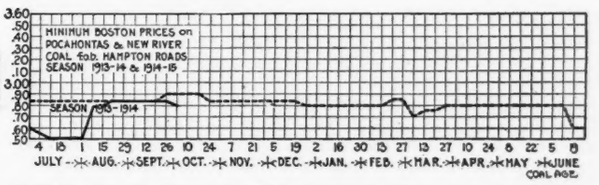
The Middlewestern trade is still contending with a completely demoralized steam market and a heavily oversold domestic trade. Production of the latter sizes is far below market requirements, and, some substantial advances in quotations have been recorded. Had it not been for the general unsettlement following the European war, the Middlewestern operators believe they would have had an unusually prosperous season.

ATLANTIC SEABOARD

BOSTON

Large volumes of Pocahontas and New River coals at the loading piers, and facing a dull market. Prices being shaded. Georges Creek fast catching up on old orders. Pennsylvania grades firm. Water freights at a minimum. Anthracite demand is streaky.

Bituminous—The steadily increasing accumulation of coal at Hampton Roads does not speak well for the state of the market. The $2.85 price is still maintained in most cases, but concessions are known to have been made and it is generally felt that lower prices will prevail before the end of October. The export trade shows a further decline in tonnage, and taking everything together, the difficulty of arranging foreign exchange and in some instances the 60- and 90-day settlements, the amount and the character of the offshore business that was offering so freely in early August has proved much of a disappointment. It was relied upon at least to steady the Tidewater situation, but with this prop to the market materially weakened, and the generally slack condition in manufacturing in New England, it is hard to see how a slump can be prevented.


MINIMUM BOSTON PRICES on POCAHONTAS & NEW RIVER COAL f.o.b. HAMPTON ROADS SEASON 1913-14 & 1914-15
DOLLARS
SEASON 1913-1914
JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE

Stocks are so large in this territory that even shipments for application to contracts are scaled down to the smallest tonnages. The few cargoes that come forward only partly sold, met with slow response. It is certain that the nominal price of $3.78 on cars Boston will have to be shaded materially if any buying is to be developed.

Further signs are observed of a better supply of Georges Creek available at all points. The shippers were far behind on their orders during August and September, but the prospect is more than favorable now for normal shipments the remainder of the season.

The Pennsylvania grades show no special change. All-rail the demand is better than at tide, but in no direction can the market be called anything but slack. The low-priced coals are at a standstill.

Water Freights are at a minimum, 65c. being the rate on large vessels, Hampton Roads to Boston. There is almost no inquiry, and certain of the steam colliers have been chartered to run to the West coast.

Anthracite demand is not quite up to expectation. The extremely unseasonable weather in late September doubtless had some effect and from now on there should be more business for the retailer. The shippers are loading a fair amount of coal but the orders are mostly for odd lots to patch out local stocks and the movement is by no means as steadily as is usually the case at this season.

Wholesale prices on bituminous are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.90@1.50	$1.25@1.65	$1.67@1.77	
Philadelphia*	2.15@2.80	2.50@2.90	2.92@3.02	
New York*	2.40@3.10	2.80@3.20	3.22@3.32	
Baltimore*	.....	.....	2.85@2.95	
Hampton Roads*	.....	.....	.....	$2.80@2.85
Boston†	.....	.....	.....	3.60@3.78
Providence†	.....	.....	.....	3.63@3.73

* F.o.b. †On cars.

NEW YORK

Bituminous stagnant but with a strong undertone. Contract shipments restricted and there is no prompt market. Anthracite opening up in a satisfactory manner. Cool weather stimulates buying.

Bituminous—It is generally felt that the soft-coal market has touched bottom. The trade is certainly dull, almost to the point of complete stagnation, and yet there is a strong undertone that indicates excellent recuperative powers when the industrial situation improves. The salient features of the current situation are the impressive manner in which prices are being maintained and the general absence of demurrage coal, together with the shortage of the high-grade varieties. The absence of demurrage coal is due, in part at least, to an evident change in the policy of the Western Maryland Ry., this road having been chiefly responsible for the excess accumulation of demurrage coal at Tidewater during the previous slump in the market during the summer. Shipments from that section are now restricted considerably below the general average for the bituminous mines.

The general movement on contract is only fair, some companies, such as public service corporations, taking their usual full quotas but others curtailing heavily. Stocks in the hands of the consumers are at a minimum, and when the long expected upturn sets in, there will undoubtedly be a heavy initial demand until normal stocks are again accumulated. An important exception to this rule is one of the large coal roads which has been stocking heavy tonnages in order to keep the operators on its lines going; its surplus is now so large, that even it has been compelled to suspend for the time being at least.

The New York market continues quotable on the following basis: West Virginia steam $2.50@2.60; fair grades Pennsylvania, $2.55@2.65; good grades of Pennsylvania, $2.70@2.80; best Miller Pennsylvania, $3.10@3.15; Georges Creek, $3.15@3.25.

Anthracite—The hard-coal season is opening up in an entirely satisfactory manner. The recent cold weather has stimulated considerable activity among buyers, many of whom deferred stocking during the summer because of the unsatisfactory financial conditions. The mines are working on practically full time and the line trade is particularly strong, especially in New England.

In the domestic grades, egg coal continues practically the only long size being offered in a few isolated instances down to the April circular; however, the lower temperatures are having a beneficial effect upon it, and it is now beginning to move better. Stove coal continues in the heaviest demand and shortest supply, shipments being substantially less than market requirements in all directions, both all-rail and at tidewater. The demand for chestnut is increasing and few sales are reported at less than the full circular.

The situation in the smaller sizes is not so favorable. Pea coal is the strongest there being a heavy movement all-rail with occasional premiums noted but at Tidewater the situation is easier and the full circular is not always obtainable. All the steam grades are generally heavy with the possible exception of barley; it is particularly difficult to find prompt disposition for No. 2 buckwheat, and there is some accumulation of this size.

The New York anthracite market is now quotable as follows:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$5.10	$4.65@5.10	$5.05	$4.60@5.05
Egg	5.35	5.10@5.35	5.30	4.80@5.30
Stove	5.35	5.35@5.45	5.30	5.30@5.40
Chestnut	5.60	5.50@5.60	5.55	5.45@5.55
Pea	3.55	3.45@3.55	3.50	3.40@3.50
Buckwheat	2.80	2.70@2.80	2.50@2.75	2.25@2.75
Rice	2.30	2.10@2.30	2.00@2.25	1.50@2.25
Barley	1.80	1.70@1.80	1.75	1.50@1.75

PHILADELPHIA

Anthracite stimulated by cool weather. Better demand for prepared sizes, but steam grades little heavy. No perceptible improvement in bituminous.

Anthracite—The cool weather of last week has had a perceptible influence in the buying of anthracite. Dealers are not overwhelmed with orders, but claim that the volume of trade received indicates that the fall and winter demand is about commencing, and look for good business from now on. The only really depressing feature is the poor outlook for the steam sizes. The market is about absorbing the production of pea, but buckwheat and smaller are still long, and are going back into stock. This is accounted for by the fact that the mines are working full time, and the market is not yet ready to absorb the entire output of these sizes. Added to this, industrial establishments using the junior sizes of coal, are in many cases working on curtailed time. The large apartment houses, however, will soon begin to start their heating systems, and it is expected that the operators will soon have no trouble in disposing of their entire output: and as the colder weather sets in, to draw on their stocks to fill the current demand.

Outside of chestnut, one hears of few concessions on the circular. It seems difficult to understand, but reports of 75 to 80c. from the circular have been heard of on this size; this is undoubtedly an exceptional case, and no doubt reflects an effort on the part of the operator to rid himself of demurrage coal.

Prices at tidewater are as follows:

	Circular	Individual
Broken	$4.75	$4.75
Egg	5.00	4.90 @ 5.00
Stove	5.00	5.10
Chestnut	5.25	4.80 @ 4.90

Bituminous—The only feature of the bituminous situation seems to be the continued demand at tidewater. Shipments to the East are heavy, compared with conditions a few weeks ago. The line trade, however, shows little or no signs of improvement.

BALTIMORE

Distinct improvement in anthracite. Bituminous market continues flat, slack still being the heavy feature. General business shows signs of awakening, but improvement is slow.

That hard coal is improving from day to day is undoubted. Steam sizes are only slightly improved but the call on the trade for domestic grades is getting much better. The late September delivery has been well up to the seasonal average for some of the dealers at least, and the householder who held off in the early spring and summer buying is now getting into the market rapidly. A larger number than usual deferred stocking this season and the prospects for October and November are quite encouraging in the domestic lines. The majority of coal men here will probably have their business on the full winter schedule by the first of November.

While the export trade in bituminous continues fairly large the general situation on soft coal is far from satisfactory. The demand for industrial fuel is far below what it should be. Except on contracts of long standing the Northwest, New England and the South are taking far less coal than was the case at this time last year. Prices are also unsatisfactory. Pennsylvania low grade coals are still offering at the mines below the dollar mark in some cases, while best Pennsylvania line fuels are quoted around $1.30 and $1.35.

The poor call from the Lakes has caused three-quarter gas in West Virginia to sell quite cheaply, and offerings around 90c. are frequent. Run-of-mine sold during the week as low as 75 and 80c., and slack was so far off color that 30 and 35c. proffers were made in some cases.

The strictly local situation is being fairly well maintained; there has been little or no surplus at tide to be sacrificed. What over-shipping took place was absorbed in the bunker trade, which has been excellent by reason of the large movement of export ships. A number of the industries here are slowly coming back into their own. The iron and cement concerns both report improvement. The rail mills of the Maryland Steel Co. resumed the past week after several weeks' suspension.

COAL CHARTERS

The "Journal of Commerce" reports the vessel situation as follows: "The steamer market was quiet in all trades, and no charters of more than ordinary interest were reported. There was a limited demand prevailing for boats in a few of the transatlantic trades, principally for grain, coal and petroleum cargoes. There are a limited number of inquiries for West India boats for single trips ,and an occasional freight offer to South America, but there is an entire absence of orders in all long voyage trades. The supply of unchartered boats available for October delivery is sufficient for the current necessities of shippers, and rates are firmly supported in all trades at about the basis of last previous charters. In the sail tonnage market a slightly increased business was done in chartering, and there is a little more demand for vessels for West India account. In all other trades the demand continues light, with rates nominal and unchanged."

Coal charters have been reported as follows:

Vessel	Nationality	From	To	Tons	Rate.
Romsdal	Norwegian	Baltimore	Havana	2028	
Teesdale	British	Norfolk	Jamaica	1560	
Riverdale	Brisish	Baltimore	Rio Janeiro	2752	$3.84
Standish Hall	British	Baltimore	Alexandria	2544	3.60
Elio	Italian	Baltimore	West Coast Italy	2208	
Sava	Italian	Norfolk	Naples	1018	
Carrie A. Lane		Philadelphia	Ponce, P. R.	703	
Brina P. Pendleton		Philadelphia	Point-a-Pitre	821	
J. Edward Drake		Philadelphia	Mayport	789	
Van Allens Boughton		Philadelphia	Boston	1909	

Note—Steamers are indicated by **bold face** type, all others being schooners.

HAMPTON ROADS

Export shipments still continue heavy with a fair amount of coal going coastwise. September establishes a new high record for tonnage. Outlook hopeful.

Dumpings still continue heavy at all piers. Export shipments for the week have gone to Naples, Campana, Piraeus, Montevideo, Palermo, Bridgetown, Cristobal, Kingston, Brindisi, Gibraltar (for orders) and Chandler (Quebec). This latter cargo consisted of about 2500 tons of nut and slack and was taken by the steamship "Thyra Menier." There was also a small cargo of run-of-mine coal loaded for San Juan, Porto Rico. One of the most interesting shipments going coastwise went into the S. S. "Lewis K. Thurlow" which took about 4200 tons. This vessel will go via the Panama Canal.

Prices on the various grades remain about the same as they have been for the past several weeks and while there are reports of sales being made above circular prices it is impossible to get these confirmed. On account of the heavy demand for prompt shipment, coal is now being taken from the storage pile of the Gulf Smokeless Coal Co. at Sewalls Point, reloaded into cars and dumped into vessels.

The outlook at this time points to September being a record month for dumpings at tidewater; the total figures should run considerably over a million and a quarter tons.

The accumulation of coal in the railway yards is perhaps somewhat less than it has been for the last two or three weeks but at the same time there is ample on hand to take care of vessels in port and any due during the next few days. Shipments are making good time from mines and with the coal accumulating there is every evidence that the shippers at Hampton Roads ports are well prepared to take care of any orders which may be offered.

LAKE MARKETS

PITTSBURGH

Market gives still poorer account of itself, no quarter showing increased demand, while Lake and manufacturing demand promise decreases. Prices very irregular.

The local coal market has continued to lose ground. Lake shipments are tapering off further, demand from retail dealers is the lightest for this date in years, railroad demand has decreased slightly, and the demand from manufacturers generally, which was showing some slight increase a week or two ago, is now tending to decrease. The steel mills are operating at not over 50% of capacity at the moment, and are receiving orders in such small volume that a rate of 40% or less is likely within a few weeks.

There is hardly any demand for free coal, and the market is not clearly established. On the limited volume of business done prices are irregular, being down to 50c. or less for slack and close to $1 for mine-run, while there is no doubt that occasional sales have been made at less than $1. Mining operations in the Pittsburgh district are at about 50% of capacity, or the smallest since April. Circular prices are purely nominal and unchanged as follows: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in., $1.50, per ton at mine, Pittsburgh district.

TORONTO, CANADA

Warm weather and accumulated stocks have restricted the demand. Manufacturing still heavily curtailed but outlook more hopeful.

The market has latterly been very quiet, as many consumers laid in large stocks shortly after the outbreak of the war. The warm weather has also lessened the demand for domestic purposes. There is so far little improvement in the industrial situation and many factories remain closed or are working much below capacity, though conditions in this respect are gradually improving and the increased demand in some lines formerly supplied by Germany points to a speedy renewal of activity.

There are ample supplies of coal on hand and operators are making active endeavors to push sales. Prices are stationary as follows; with some shading in car lots of bituminous. Retail, anthracite, egg, stove and nut, $7.75, grate, $7.50; pea, $6.50. Bituminous steam, $5.25; screenings, $4.35; domestic lump $6, cannel, $7.50. Wholesale f.o.b. cars three-quarter lump $3.83, screenings, $2.89.

BUFFALO

No stir in bituminous and none expected in the immediate future. Slack more quiet than formerly. Anthracite selling well except egg.

Bituminous—The demand is still light. In fact there is scarcely any demand except in a modified form, as the trade is canvassed so closely that the consumer has little chance of giving out unsolicited orders. This means an exceedingly dull market till there is a revival of manufacturing.

The export demand since the war broke out has been disappointing. In fact shippers in the various Pennsylvania bituminous fields are shutting up their export offices pending a return of their former export demand.

The Canadian trade is at a low ebb. Collections there are poor and a new customer is taken on with the greatest of caution, for the seller feels that some special reason has shut the buyer off from his former supply and this was not from want of coal to fill orders. Some had Canadian business of that sort offered them lately which has added to the natural suspicion.

The prices on bituminous are practically unchanged, though slack has been hit hard on account of the warm September. Regular prices, obtained only for the best grades, remain on the basis of $2.80 for Pittsburgh lump, $2.75 for three-quarter, $2.55 for mine-run and $2.15 for slack. Allegheny Valley prices continue about 25c. lower than Pittsburgh for sizes, with slack about on a par with Pittsburgh.

Anthracite—The feature of this trade is the continued slack demand for egg. The practice of substituting stove for egg still keeps up and will do so till regulated by a readjustment of prices. The end of September has been quite different from former months. There has been no further decline to look for, so the buyer prefers to wait till another month comes in, so that his account will not come due so soon.

The Lake trade has shown more activity, shipments for the week amounting to 114,200 tons, which is a larger amount than for several weeks. Clearances were almost entirely to Chicago, Duluth and Sheboygan. There was nothing for Milwaukee or the Canadian ports of Lake Superior, as they are well supplied with both anthracite and bituminous. It does not appear likely now that the late fall will show much increase in the movement by Lake, as the amount on Upper-lake docks is large.

TOLEDO

Cold spell stimulated domestic business. Steam coal shows weakness and slack is hard to dispose of. Lake movement fair.

The cool spell helped the market but was not of sufficient duration. There seems to be a little more buying of steam coal recently but prices are not showing any greater strength. Slack is extremely hard to move and prices are the lowest known here in many years. Mine-run is said to be showing slightly more strength. The Pittsburgh No. 8 operators and miners have not yet reached an agreement and this is holding back some of the contract business.

The T. & O. C. docks have been quite active during the past week and considerable coal is going up the Lakes. Prices are holding close to the list although there are some concessions being made.

COLUMBUS

Continued weakness in the steam trade, together with a slackening in domestic demand, are the principal features of the Ohio market. Lake trade continues active. Sellers still maintain an optimistic view.

Not much improvement is reported in the coal trade in Ohio during the past week. In fact, the only change has been for the worse, as the domestic demand is now feeling the effects of the higher temperatures and orders are not coming in as rapidly. The tone of the trade is still good, and with more favorable weather, the future prospects are not believed to be particularly bad.

Dealers have had a slack demand since the weather has grown warmer, but prices on domestic grades are still stiff; in fact, there is some talk of an advance in retail prices the first of the month, but this will hardly be done under present weather conditions. Preference is still shown for the better grades.

The Lake trade is fairly good, although the tonnage handled at Toledo is not quite as large as formerly. Chartering of boats is still active and the docks of the Upper Lake ports are in good shape generally.

Steam business is slow and there are no immediate prospects of improvement. Manufacturing establishments are only buying what they need for the present. Very few steam contracts are expiring at this time. Railroad fuel contracts are mostly closed up and prices are between $1.02½ and $1.10.

Production in Ohio fields has been fairly large. In the Pomeroy Bend field, the output is estimated at normal, and in the Hocking Valley and Jackson it is about 85% of the average. The Crooksville field reports about 75%, and the same is true of Massillon. Eastern Ohio is still idle, and there are no negotiations for the adjustment of the wage agreement.

Prices in the Ohio district are:

	Hocking Valley	Pomeroy	Kanawha
Re-screened lump	$1.70	$1.75	
Inch and a quarter	1.60	1.60	$1.50
Three-quarter inch	1.45	1.45	1.45
Nut	1.15	1.50	1.15
Mine-run	1.15	1.15	1.15
Nut, pea and slack	0.30	0.35	0.30
Coarse slack	0.20	0.25	0.20

CLEVELAND

Fine coal is demoralized and coarse coals are little better. Lake trade is slow without signs of improving. Shippers are now of the opinion the season will close early.

Hocking slack that has been on the market for a week has been sold at ten cents less than the freight. Last week 100 cars of nut and slack were sold for shipment at 7½c., which in this market means $1.07½ delivered. Though quotations for shipment are nominally the same as a week ago the spot market is very weak as some coal is under car service. A good illustration of the condition of the market for Youghiogheny was an offer made by a shipper to send high grade coal to a local broker to be sold on consignment without any restrictions.

The light Lake business has curtailed operations in almost all districts shipping into Cleveland and slack is not really plentiful. With a few days of chilly weather there would be a chance of the market recovering, but a number of manufacturers are running so light and have such good supplies on hand that they are out of the market for three days to a week.

Pocahontas is in better demand owing to the large retail trade and lump and egg sizes are a little higher than a week ago. The small demand for Pocahontas slack is partially responsible for the curtailment in the production of prepared sizes, which have been less plentiful. The operators are no longer using export prospects as an excuse for refusing orders for prepared sizes.

The Lake trade has seen its best for this season. How much the shipping contracts have been reduced is manifested in the action of the owners who have been operating ships to carry contract coal. Ore shipments will end in most instances Nov. 1 and not later than Nov. 10 in almost all the others. The ship owners have decided to lay up a large number of vessels the next two weeks and will use the remainder of their fleets to fill out the coal contracts. By laying up part of the fleets they will be able to drag the ore out over a period that will let them have cargoes both ways.

Prices for current shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmount	W. Va. No. 8
Lump	$3.75				
Lump, 6 in.			$2.45		
Egg	3.75				
Egg, 6 in.			2.10		
Lump, 1¼ in.		2.40	2.25		
Lump, ¾ in.		2.30	2.10	2.00	2.05
Mine run	2.75	2.15	1.95	1.90	1.95
Slack	2.40	1.55	1.50	1.50	1.50

CINCINNATI

Demand still weak in the steam market. Price concessions are less numerous. Improvement anticipated shortly in the steam grades.

The controlling factor in the coal market in this vicinity is still the lack of any demand for steam coal. Screenings are still available in excess quantities. The call for domestic coal continues considerably behind what it should be at this time, but is excellent as compared with the steam business. Accordingly, extremely low prices for spot coal are still the rule, although perhaps fewer sales of distress coal are taking place.

It is certain, however, that with the winter season immediately ahead, and probably most of the domestic trade yet to be supplied, screenings will continue to be a drug on the market unless the expected revival in manufacturing takes place very soon. Numerous plants are still closed down, but reports of large orders indicate that activity may soon be resumed. The refusal of consumers to accept deliveries on contracts, has been responsible for much of the cheap coal thrown on the market, complicating the difficulties of the situation materially.

DETROIT

Market almost at a complete standstill. Demand reduced to a minimum.

Bituminous—Were it not for a certain year-round trade to be supplied, business in this market would be almost at a complete standstill. The local industries are suffering severely from the restricted conditions prevailing in general manufacturing and there is no new demand for coal in any direction. In domestic coals, the Pocahontas grades are holding steady at $2.50 for egg and lump; Hocking lump of the 3-in. shaker variety is in moderately good demand at $1.70, while the ordinary domestic lump brings $1.60. Shipments to the Lakes are somewhat reduced, due to some difficulty in obtaining cars and the generally indifferent demand. Steam consumers are making practically no call whatever.

Anthracite—Anthracite is active, orders exceeding the immediate capacity of the dealers. Unconfirmed rumors are current to the effect that some dealers have advanced their retail prices 50c. per ton, beginning Oct. 1.

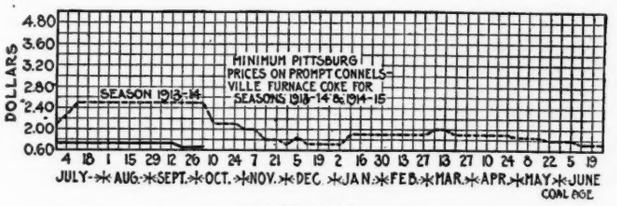
COKE

CONNELLSVILLE

Market absolutely stagnant, with prospects of decreased consumption. Current shipments 20% below maximum rate of the year.

The coke trade continues stagnant. No demand has developed for October, and it seems that the operating furnaces are fully covered. No furnaces are likely to go into blast while demand for iron and steel is so light that continued curtailment in output is in prospect. The Connellsville coke operators have been regulating production quite closely to demand, and very little coke has been dumped in the market. Prices are practically nominal, as follows: Prompt furnace, $1.65@1.70; contract furnace, $1.75@1.85; prompt foundry, $2.25@2.35; contract foundry, $2.35@2.50, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 19 at 243,695 tons, a decrease of 7260 tons, and shipments at 256,537 tons, an increase of 672 tons. Shipments in the past four weeks have averaged about 20% under the record rate of the year, attained about six months ago.


DOLLARS
4.80
3.60
3.20
2.80
2.40
2.00
0.60
MINIMUM PITTSBURG PRICES ON PROMPT CONNELSVILLE FURNACE COKE FOR SEASONS 1913-14 & 1914-15
SEASON 1913-14
4 18 1 15 29 12 26 10 24 7 21 5 19 2 16 30 13 27 13 27 10 24 8 22 5 19
JULY-* AUG.*SEPT.*OCT.*NOV.*DEC.*JAN.*FEB.*MAR.*APR.*MAY*JUNE
COAL AGE

BUFFALO

The demand for coke is still waiting for a stir in the iron trade and a better tone to business as a whole. While regular quotations are about as formerly, some low prices for foundry are reported. The average bituminous shipper wants no coke customers, for the duller the trade the more complaints are made. Quotations continue on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

BIRMINGHAM

There is absolutely no market whatever for furnace coke, and only small lots of foundry coke are being shipped. While there is practically no demand, still the manufacturers seem to be holding to their prices.

CHICAGO

The coke market remains steady. Production has been curtailed to meet the limited demand for furnace and foundry coke.

Quotations are: Connellsville, $4.90; Wise County, $4.75; byproduct, egg, stove and nut, $4.85; gas house, $4.25.

SOUTHERN

BIRMINGHAM

Lump coal shows increase in tonnage. Local steam trade quiet, but indications point to early improvement. Pig iron dull.

Dealers are increasing their orders for lump coal, due to approaching cool weather, and this has stimulated the market to some extent. The local demand for steam coal is far from satisfactory, but the appearance in Birmingham this last week of brokers from New Orleans and Mobile indicated that there were some deals on for a large tonnage for bunker purposes. It was rumored that a large amount of steam coal would be shipped to Panama and South America during October. Pensacola brokers were also in Birmingham getting a line on the possible supply for quick shipment. A representative of the Alabama operators will visit South America this month; it is estimated that during the next six months that territory will need something like 2,500,000 tons of coal.

Production in Alabama is only fairly good, as some of the large railroads are taking the minimum on their contracts, and the local demand is not up to the average. Officials of the various railroads state that no trouble is looked for in the car supply question this fall. The pig-iron business has suffered a period of stagnation during the past two weeks, very little being sold.

LOUISVILLE

Domestic business holding steady though collections are slow. A combination of adverse conditions has created an abnormally depressed situation in the steam trade.

Future business and collections are the chief concerns of the coal operators in the Kentucky market at this time, though the volume of business, especially in domestic coals, has held up well. It is reported, however, that the retail dealers are exhibiting a tendency to slow up, and collections are poor.

The cotton situation in the South is referred to at length by the dealers and operators. The stagnation of that market

is affecting every line in the South. For instance Georgia, the largest user of commercial fertilizer of any state in the Union, is buying practically none while the railroads, already deprived of their cotton tonnage, will have no fertilizer to haul and will therefore require much less coal than in normal years. In spite of these things the coal interests are optimistic about the future. They feel that it is only a question of holding on for a while and redoubled prosperity will be bound to come. Prices continue with practically no change.

MIDDLE WESTERN

INDIANAPOLIS

Domestic grades advanced 10 to 25c. a ton, with indications of a further increase if the screenings and other steam grades do not improve. Lump moving well to railroads and householders. Mines working four days a week. Some car trouble.

Prices have been advanced 10 to 25c. a ton at the mines for domestic grades. The rise is due mostly to the low price of screenings, lump coal prices being put higher to offset this. The railroads, which now use mostly lump, are better buyers and householders generally have been getting ready for the colder weather of October. Lump coal is selling generally at $1.75. There is no set price for screenings. The mines that make a specialty of domestic coal have been running full time and the others about four days a week. With the anti-smoke laws making necessary the use of automatic stokers, industrial plants are using a larger proportion of screenings than formerly. Other steam grades are suffering in price along with slack.

Operators are now saying that if it had not been for the war upsetting industrial conditions in this country, trade in September would have been better than for many years. Retail dealers report larger buying than usual, as consumers seemed to expect an advance by the first of October. It is intimated that there may be another advance soon. Operators are feeling the first of the fall car shortage, one company totaling up a ten-day loss at its various mines the last week.

CHICAGO

Anthracite trade unusually brisk. Smokeless in steady demand, with price on mine-run strong. Hocking market firm, but only fairly active. Indiana operators advance price on domestic lump.

There is still quite a heavy demand for domestic coal in the Chicago market. The anthracite trade has been exceptionally brisk; the only size difficult to move is egg coal.

Smokeless operators have a good demand. The mine-run price for the best grades has remained firm at $1.40; the shippers of off-grades have fixed $1.25 as their minimum, and are getting $1.40 on most sales. Lump and egg coal is still scarce, the price holding firm at $2.25 the mines. The Hocking market is firm, but only fairly active on a basis of $1.60 at the mines for lump coal. The country sales at this price have been interfered with by price cutting among some of the dock companies, which have been endeavoring to move a considerable accumulation of coal.

There has been an easing up in the demand for splint coal. In the Carterville field, lump, egg and nut coal is quotable from $1.60 to $1.75. There have been some recessions in price on domestic sizes of Franklin County coal. Indiana operators have announced an advance on domestc lump coal to $1.75.

Prevailing prices in Chicago are:

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump	$2.47	$2.65@2.80	$2.42@2.52	
Steam lump	2.02		1.97	
Egg		2.65@2.80		4.05@4.30
Mine run	1.87	2.15@2.25	1.87	$3.30@3.45
Screenings	1.07@1.12	1.40@1.50	1.07@1.12	

Harrisburg quotations are: Domestic lump and egg, $2.65@2.80; steam lump, $2.15@2.20; mine-run, $2.15@2.25; screenings, $1.40@1.50; No. 1 nut, $2.80; No. 2 nut, $2.30@2.40.

Carterville prices are: Lump and egg, $2.65@2.80; No. 1 washed, $2.80; No. 2 washed, $2.30@2.40.

ST. LOUIS

Domestic grades heavily oversold and production continues below requirements, due to light steam demand. Steam market still demoralized. Standard domestic coals not showing their customary form this season.

There is little change in the local market, with the exception, perhaps, that the steam grades are a trifle easier. Operators all report that they are far oversold on the larger sizes of coal, and in order to avoid having orders pushed on them, they are asking as high as $1.85 to $2 for lump and egg; $1.75 is about the top of the market, but there are indications of a further increase soon unless the steam market picks up. This is not likely to occur in the high-grade fields on account of the deplorable condition existing in the inner district.

The high-grade washed market picked up considerable during the past week, especially on the larger sizes, Nos. 1 and 2 moving quite freely. Screenings fell off to 20c. and were hard to move at that figure. The top of the Standard 2-in. lump market seems to be about $1.15, although some operators have been able to get $1.20. Offsetting this, they are giving their screenings away for the freight charges; 3x6 egg coal is selling for $1, and nut coal all the way from 35 to 75c. The domestic demand for Standard coal seems lighter this year, due principally to the fact that Carterville and Franklin County coals seem to be getting a better foothold.

In the high-grade market, lump and egg will be in good demand at from $1.65 up, with tendency to go to $1.85 the early part of October.

Pennsylvania anthracite is moving in in good tonnage, and the demand seems to be good. Smokeless is a drug on the market, and there are no buyers at any price.

The prevailing circular is:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump	.....	....	$1.30	$1.10@1.20	$1.20
3-in. lump	.....	....	1.40	.....	.....
6-in. lump	$1.75@1.85	....	1.50	1.25@1.35	1.40
Lump and egg	1.85@2.15	$2.25	.....	.....	1.15
No. 1 nut	1.45@1.50	....	.....	0.75@0.80	.....
Screenings	0.70@0.75	....	0.80@0.85	0.05	0.10
Mine-run	1.05@1.10	....	.....	0.75@0.80	.....
No. 1 washed nut	1.50@1.65	2.25	1.50	....	.....
No. 2 washed nut	1.35@1.40	....	1.35	....	.....
No. 3 washed nut	1.10@1.15	....	.....	....	.....
No. 4 washed nut	1.00@1.05	....	.....	....	.....
No. 5 washed nut	1.20@1.25	....	.....	....	.....

Retail prices, delivered, are: Lump and egg, Carterville, $3.50; Mt. Olive, $3; Standard, $2.75; smokeless, $6.25@6.50. Anthracite, chestnut, $8.50; egg and stove, $8.25; grate, $6.25@6.50.

KANSAS CITY

No change in prices and little improvement in the movement. Trade very unsettled. Circulars scheduled for an advance soon.

Kansas City is not laying in heavy supplies of coal for the winter, and yet retailers declare that coal will be consumed in as large quantities as ever, the bulk of the buying coming later. There has not been a real touch of winter yet. And the fact that the Kansas natural gas receivers are holding out prospects of much gas this year, is a factor in the situation. On the other hand, the prospect that steam plants may not get fuel oil possibly will offset any advantage gas consumers will have. Some of the large buildings which buy heat depend upon natural gas for running their own plants early in the season before gas gets low. The wholesalers in heat started up their plants at fall schedule last week.

Through Kansas, but not in Kansas City, there are notices being issued by retailers that coal prices will advance Oct. 1. In Kansas City there are no threats of increases, but dealers believe that coal will probably rise by Nov. 1.

PRODUCTION AND TRANSPORTATION STATISTICS

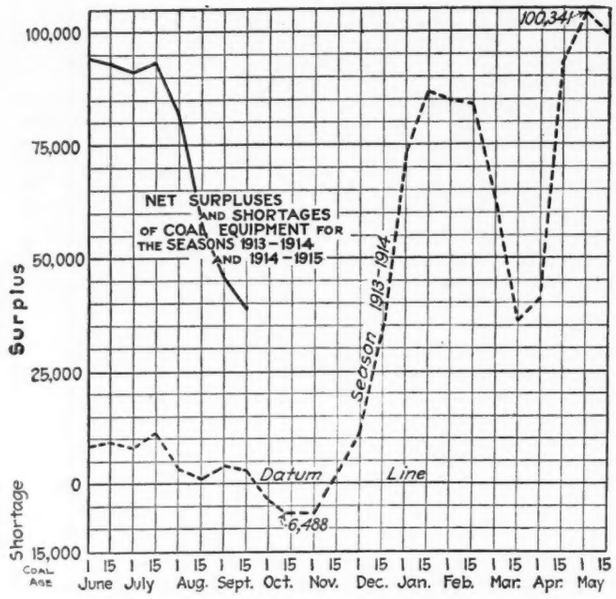
THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Sept. 15, as follows:

	Surplus	Shortage	Net*
New England Lines	1,326	0	**1,326**
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	5,232	0	**5,232**
Ohio; Indiana; Michigan; Western Pennsylvania	16,957	0	**16,957**
West Virginia, Virginia, North & South Carolina	3,194	9	**3,185**
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	4,096	0	**4,096**
Iowa, Illinois, Wis., Minn.; North & South Dakota	2,823	0	**2,823**
Montana, Wyoming, Nebraska	963	0	**963**
Kansas, Colorado, Missouri, Arkansas, Oklahoma	1,968	89	**1,878**
Texas, Louisiana, New Mexico	258	6	**252**
Oregon, Idaho, California, Arizona	2,741	87	**2,644**
Canadian Lines	0	0	**0**
Total	39,558	191	**39,367**

	May 15	June 1	June 15	July 1	July 15	Aug. 1	Aug. 15	Sept. 1
Surplus	99,664	94,770	93,520	91,280	93,509	82,284	56,560	46,141
Shortage	313	7	49	430	292	110	496	66
Net*	**100,341**	**99,351**	**94,763**	**90,850**	**93,217**	**82,174**	**56,064**	**46,075**

***Bold face** type indicates a surplus.



BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during June and the first six months of the last two years, in short tons:

	June		6 Months	
Anthracite	1913	1914	1913	1914
Baltimore & Ohio[1]	93,211	78,019	758,699	711,784
Chesapeake & Ohio[1]	1,794	1,669	8,775	7,893
Erie[3]	741,319	826,756	4,205,048	4,468,839
Pennsylvania[2 3]	776,237	855,247	5,418,231	5,654,277
Virginia[2 1]	223	84	709	136
Total 5 roads	1,612,784	1,761,775	10,391,462	10,842,929
Bituminous				
Baltimore & Ohio[1]	3,212,728	2,517,909	17,555,910	16,234,637
Buffalo, Roch. & P.[1 2]	794,687	552,867	4,561,113	3,862,002
Buffalo & Susq.[1 2]	149,139	70,537	903,535	561,309
Chesapeake & Ohio[1]	1,605,063	1,822,962	7,980,768	9,672,008
Erie[3]	11,034	7,443	274,252	40,126
Hunt. & Br'd T. Mt.[1 2]	99,128	62,416	673,795	528,635
New York Central[3]	677,267	604,937	4,468,852	3,923,543
Norfolk & Western[1 2]	2,061,911	2,315,956	11,431,452	12,516,321
Pennsylvania[1 3]	4,189,969	3,897,544	24,232,419	23,555,182
Pitts. & Lake Erie[1 2]	1,078,121	975,158	6,301,713	5,457,907
Pitts. Shaw. & North[1 2]	201,798	181,711	1,324,848	1,198,520
Virginia[1 2]	304,030	321,181	2,201,033	2,027,726
Western Maryland	247,354	209,502	1,501,966	1,357,061
Total 13 roads	14,632,229	13,540,123	83,461,656	80,934,971
Coke				
Baltimore & Ohio[1]	386,920	298,237	2,437,886	1,839,861
Buffalo, Roch. & P.[1 2]	41,771	24,207	296,925	142,604
Buffalo & Susq.[1 2]	25,151	35,294	155,422	164,803
Chesapeake & Ohio[1]	30,015	29,392	180,538	207,755
New York Central[3]	6,242		35,627	
Norfolk & Western[1 2]	123,941	87,921	840,642	580,668
Pennsylvania[1 3]	1,161,521	793,463	7,386,908	5,227,885
Pitts. & Lake Erie[1 2]	555,207	394,508	3,625,350	2,693,577
Pitts. Shaw. & North[1 2]			9,383	
Western Maryland	4,582	4,001	40,093	38,505
Total 10 roads	2,335,350	1,667,023	15,008,774	10,895,658

Total Coal and Coke 13 Roads	1913	1914
January	19,266,202	18,124,936
February	17,546,496	15,419,439
March	17,631,345	20,201,479
April	16,850,690	15,463,143
May	18,986,796	16,495,640
June	18,580,363	16,968,921
Total, 5 months	108,861,892	102,673,558

[1] Includes coal from connecting lines.
[2] Includes company's coal.
[3] Does not include company's coal hauled free.
Note:—The Southern Railway hauled 324,025 short tons of bituminous coal during May, and 1,626,196 short tons during five months.

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during June, July and August of this year and last year:

	June		July		August	
	1914	1913	1914	1913	1914	1913
Coal	2,380,795	3,061,929	2,594,407	2,938,723	2,769,453	3,295,123
Coke	298,237	396,920	255,650	391,485	242,283	391,999
Total	2,769,032	3,458,849	2,850,057	3,330,208	3,011,736	3,687,122

FOREIGN MARKETS

GREAT BRITAIN

Sept. 18—Outside of the navy requirements, business is very limited on account of difficulty on the part of foreign buyers of arranging cash. On this account, and in spite of the diminution in output, free coal is more plentiful than it has been for some weeks, and prices are inclined to be weaker. Quotations are approximately as follows:

Best Welsh steam	$5.04@5.28	Best Mountmouthshires	$4.26@4.32
Best seconds	4.56@4.86	Seconds	4.08@4.20
Seconds	4.26@4.38	Best Cardiff small	1.68@1.74
Best dry coals	4.38@4.62	Seconds	0.96@1.44

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage, and for cash before shipment or against invoice.

Freights—Tonnage is offering freely, but orders are scarce. Rates are approximately as follows:

Gibraltar	$1.68	Aden	$2.16
Malta	1.68	Colombo	2.22
Marseilles	1.64	Sabang	2.22
Algiers	1.44	Singapore	2.40
Genoa, Savona	1.56	Las Palmas	1.80
Naples	1.68	St. Vincent	1.92
Venice, Ancona	1.86	Rio Janeiro	3.36
Alexandria	1.86	Monte Video	3.12
Port Said	1.80	Buenos Ayres	3.36

Operations in the coal industry are still restricted in some measure by the shortage of empty wagons, the reduced supply of skilled labor, the limitation of the exports and other factors in the situation which have had to be taken into account since the outbreak of war. The returns regarding employment at the mines cannot be regarded as unsatisfactory, the Board of Trade stating that while a considerable number of collieries are working only four or five days a week, there is considerable pressure in the steam coal trade in South Wales, where more men could be employed if they were available. Many pits have worked less than four days a week recently.

In the Newcastle district, there has been little change of importance in the state of the coal market. Business continues dull in all departments, but the shipments show some slight expansion, and there are signs that the inquiry is growing.

In the Yorkshire district, trade is fairly brisk. The inquiry for large steams on export account is good, and, when facilities permit, a more active state of affairs is expected. Some collieries have benefited by government contracts for steam coal, more of which may follow.

In the Midlands, the house coal position is quieter now that collieries have dealt with the rush of house coal orders experienced at the beginning of the month. There is no speculative buying going on, merchants just ordering for their immediate requirements.

In Lancashire, the fuel market is quiet but steady, and prices are held fairly well, but the uncertainty about credit is hindering sales. Many of the mills are idle, and consumption is still restricted.

In South Wales, there has been but a limited inquiry for all descriptions of steams. Shipments on Admiralty account and for foreign governments are slackening, leaving more coal of all qualities on the market, and more easiness prevails, especially for the second and cheaper qualities.

Rarely has the wholesale market for railborne house coal been so dull and lifeless as it is at the present time. Notwithstanding the somewhat lower temperatures generally and the colder nights and mornings in particular, the retail trade remains exceedingly quiet. The railway congestion due to military requirements has been relieved in some measure during the past week or more, with the result that many collieries are getting a better supply of empty wagons and are working with less irregularity. There can be no doubt, at any rate, that there are now ample supplies upon the London market.

No change has occurred in retail prices as yet, although an advance is now much overdue. The War Office has taken over a very considerable number of the horses employed in the coal trade, and may have to take over more to make good the wastage of war, which will probably be very serious. There are a few motor lorries here and there, but they are only suitable for special work, and it is quite certain that in these times of stress there will be a limit to the available supply of horses.

The seaborne trade remains quiet. Since the previous Friday, 33 colliers had passed up the river.—"The Iron and Coal Trade Review."